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WILDLIFE REVIEW

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Conservation: By Federal agencies

Committee. Hearings before the Select Committee on Conservation of Wildlife Resources, House of Representatives, Seventy-seventh Congress, Second Session, x x x November 17, 18, and 19, 1942 (U. S. Government Printing Office), 204 pp., figs., maps, tables, 1943.

Statements of the achievements and needs of Federal organizations in the wildlife field, including the National Park, Forest, Fish and Wildlife, and Soil Conservation, Services. The report compiles information not readily available elsewhere, as on estimated numbers of big game on the national parks and forests, the status of Federal Aid in Wildlife Restoration, the game laws and regulations of the Republic of Colombia, and a summary of the work of the Civilian Conservation Corps, 1933-1942. Maps showing the location and other features of national forests, regions of the Soil Conservation Service, and soil conservation districts are presented.

The recommendations of the Committee based upon these hearings are contained in House Report 2746, 77th Congress, 2nd Session (U. S. Government Printing Office, 24 pp., 1943).

Conservation: Wildlife in wartime

Callender, R. E., Phil D. Goodrum, and Walter P. Taylor. Wildlife and land use in wartime. A Texas study, The Cattleman (Coliseum Bldg., Stockyards, Fort Worth, Texas), 29(5), Oct. 1942, pp. 51, 54-58.

Conservation is now more vital than ever, and wildlife conservation has no inconsiderable part in the program; the great financial return from wildlife is indicated. Causes of wildlife depletion in Texas are enumerated and general recommendations for counteracting them are made. These include all of the points stressed in ideal modern conservation research, education, and administration, and in wildlife management. They constitute a thorough and up-to-date code that should receive strong public support. Special recommendations also are given for the restoration and management of the deer, antelope, peccary, muskrat and other fur animals, squirrels, the wild turkey, bobwhite, mourning dove, prairie chicken, and waterfowl. The control of rats and mice and the improvement of fisheries also receive attention. The great value of wildlife as a food and recreational resource is emphasized.

Control: Hazards of strychnine poisoning operations

Ward, Justus C. Rodent poison and bird life, Wyoming Wild Life (Wyoming Game and Fish Dept., Cheyenne), 7(4), April 1942, pp. 15, 20.

Strychnine is the poison used against burrowing rodents in Wyoming. Numerous experiments by Biological Survey workers in the past have indicated that strychnine-poisoned grain is not attractive to game birds and, as distributed in rodent control, provides no hazard for them. Tests carried on in Wyoming in 1940 proved that these findings apply to sage grouse. These birds do not readily take oats, the standard base for poisoned baits, and even when

force fed show considerable resistance to strychnine poisoning. Various smaller birds are more easily killed, however, and to minimize the danger to them, it is recommended that baits be placed within the burrows or that poisonous gases be substituted.

Control: Of hare, snowshoe

Wilson, F. G. Snowshoe hare damage and control, Wisconsin Conservation Bulletin (Wisconsin Conservation Dept., Madison), 7(12), Dec. 1942, pp. 4-7, 4 photos.

The damage done by the snowshoe hare to young forest growth in Wisconsin is greater than that inflicted by any other mammal and may even exceed the current annual loss from fire. The most severe injury occurs in spring when pine seedlings are the principal green growth available to the hares. Spraying of planting stock with a repellant is reasonably effective for the parts treated but does not protect new growth. Shooting and trapping have not been effective. The most promising method of control is the use of aspen poles on which a poisonous mixture has been painted. These are not a menace to other forms of wildlife except porcupines.

Control: Of magpie

Martin, Malcolm D. Wyoming magpie control, Wyoming Wild Life (Wyoming Game and Fish Commission), 7(10), Oct. 1942, pp. 13-15, 2 photos, 1 table.

Depredations of magpies upon domestic and wild animals, especially upon sage grouse, led to an organized campaign of trapping and egg collecting in which, within a year, more than 14,000 magpies and 25,000 eggs were destroyed.

Control: Of mammals, small

Gunderson, H., and G. C. Decker. Rodent pests of Iowa and their control, Iowa Agr. Expt. Sta. (Ames), Bul. P43 (n.s.), pp. 423-436, 8 figs.

Life history notes on, and suggestions for the control of, ground squirrels, woodchucks, pocket gophers, rats, mice, tree squirrels, rabbits, and moles.

Control: Of plague vectors

Stewart, M. A. Carbon disulphide in the control of sylvatic plague vectors, Amer. Journ. Hygiene (615 N. Wolfe St., Baltimore, Md. $2.00 a copy), 36(3), Nov. 1942, pp. 243-246, 3 tables.

Review of literature (5 titles cited) and report upon experiments in California with Citellus b. beecheyi and its fleas. Author's conclusions: "From the experimental data given above it can be concluded that fumigation of ground-squirrel burrows with even small quantities of carbon disulphide is highly efficient in killing the rodents, as has been repeatedly demonstrated,

but the chemical is very uncertain and inefficient in its lethal action on adult fleas on the hosts and in the nests when it is applied at rates as high as 4 ounces per burrow opening. Quantities greater than this would be sufficiently expensive to effect no saving over the more efficient methyl bromide and the greater amount of chemical that would have to be carried by the field men in plague control work would result again in increased cost of fumigation and decreased efficiency of the workers. Carbon disulphide is efficient and reasonably economical in creating and maintaining ground squirrel-free belts around given areas when plague infection is known not to exist in the squirrel population. This is an important aspect of sylvatic plague prophylaxis, but methyl bromide (Stewart and Mackie, 1938) should be employed when plague is known to exist in the rodents. This is necessary because, although the burrow openings are closed at the time of fumigation with carbon disulphide or methyl bromide and the fleas that may not be killed by the fumigant are thereby imprisoned, there is absolutely no assurance that the burrow openings will not be reopened by a migrating ground squirrel or some other mammal before the surviving fleas will die from starvation and thus permit the escape of infective fleas searching for a blood meal. The employment of methyl bromide as a fumigant for fleas and ground squirrels in plague-suppression is particularly important where military personnel are quartered, and especially where they maneuver in areas known to contain infected rodents."

Control: Of porcupine

Reeks, W. A. Notes on the Canada porcupine in the maritime provinces, Forestry Chronicle (10 Manor Road, West, Toronto, Canada), 18(4), Dec. 1942, pp. 182-187.

The distribution and abundance (and factors affecting it) of the porcupine in the maritime provinces are sketched and feeding habits in relation to forests are more fully discussed. Favorite food trees are listed in the order of their importance. From author's abstract: "Feeding on forest trees is extensive in parts of New Brunswick and Nova Scotia but since all of the trees attacked are not crop trees serious damage to the stand does not always follow. Damage is severe in localized areas where the stands are of particular value, as in plantations, experimental areas and around camp sites. The only method of large-scale control ever attempted in the Maritime Provinces has been the bounty system. While the effectiveness of this method has not been carefully studied, it appears from parallel cases in the United States that the bounty system is generally expensive for the degree of control effected. Control methods probably serve best if applied intensively to small areas where the damage is most serious. A method of localized control by den poisoning is discussed."

Control: Of starling

Gromme, Owen J. A method of starling control, Wisconsin Conservation Bulletin (Wisconsin Conservation Dept., Madison), 7(12), p. 14, 1 fig.

Illustration and description of the use of a trap nest-box.

Control: Of wolf

Young, Stanley P. The war on the wolf, American Forests (919 Seventeenth St., Washington, D. C. 35 cents a copy), 48(11), Nov. 1942, pp. 492-495, 526, 5 photos; 48(12), Dec. 1942, pp. 552-555, 572-574, 4 photos, 1 map.

Review of the war on the wolf in other countries and its history in the United States; for a long time, control incentives were mostly bounties in a variety of forms. Later strychnine put out by trappers and stockmen was a great factor in wolf destruction. Finally state and county bounty payments and the employment of salaried hunters brought the wolf population under control. Small numbers of the animals still exist and it is probable that this state of affairs will continue for a long time.

Cycles: Arctic animals

Chitty, Dennis, and Mary Nicholson. Canadian arctic wild life enquiry, 1940-41, Journ. Animal Ecology (Cambridge University Press, 200 Euston Road, London, N.W. 1, England. 20 shillings a copy), 11(2), Nov. 1942, pp. 270-287, 2 pls., 4 tables.

Continuation of a series, this installment of which is summarized by the authors as follows: "(1) Answers to seventy-nine questionnaires showed that 1940-1 was a year of almost universal increase in arctic foxes throughout the Arctic and Subarctic; (2) in the Eastern Arctic (north of 60° N. lat.) this improvement followed a year in which lemmings and snowy owls had started their recovery from the bottom of the previous cycle. This recovery was continued throughout 1940-1; (3) on the Western Arctic mainland no general correlation of fox, lemming and snowy owl fluctuations was revealed from an analysis of the data for 1935-41, and only in the arctic fox in the interior barren lands was there evidence of a short-period cycle; (4) sledge dogs have not suffered widespread epidemics; but on the west coast of Hudson Bay and north from Coppermine 'distemper' was spread by contact between teams." Bibliography of 10 titles.

Cycles: Lynx, Canada

Elton, Charles, and Mary Nicholson. The ten-year cycle in numbers of the lynx in Canada, Journ. Animal Ecology (Cambridge University Press, 200 Euston Road, London, N.W. 1, England. 20 shillings a copy), 11(2), Nov. 1942, pp. 215-244, 10 figs., 7 tables.

Author's summary: "(1) Hudson's Bay Company and some other records provide a record of lynx (Lynx canadensis) fur collections in Canada for 206 years. Details for smaller regions have been obtained for 1821-1934 or 1937. The regions have been constructed from the original fur trade districts, in such a way as to give fairly standard areas for comparing catches over long periods; (2) the cycle in lynx furs is very violent and regular and has persisted unchanged for the whole period. Its average period is about 9.6 years; (3) this cycle is a real one in lynx populations, which are dependent upon the snowshoe rabbit (Lepus americanus) for food, and which starve when the rabbits disappear periodically. It is therefore strong evidence of a similar cycle in snowshoe rabbits for the last 206 years; (4) the wide synchronization of the

cycle in different parts of Canada for at least 100 years, its parallel occurrence both west and east of the Rockies, and its independent occurrence in aquatic species such as the muskrat (Ondatra zibethica) and the salmon (Salmo salar), strongly suggest the existence of a climatic factor partly controlling it." Bibliography of 23 titles. A thorough, comprehensive, and well-organized presentation.

Destruction: Birds

de Schauensee, Rodolphe M. Rare and extinct birds in the collections of the Academy of Natural Sciences of Philadelphia, Proc. Acad. Nat. Sci. Philadelphia, 93, 1941, pp. 281-324.

The causes of extinction are discussed, but the article is not a general treatise on rare and vanishing birds. Rather, as indicated by the title, it is mainly made up of comment on those that are represented in the collection of the Academy.

Destruction: Mammals

Allen, Glover M. Extinct and vanishing mammals of the Western Hemisphere (American Committee for International Wild Life Protection, Zoological Park, New York, N. Y.), xv+620 pp., frontispiece (portrait of John C. Phillips to whom the book is dedicated) + 24 figs., 1942.

A systematic, detailed, and scholarly account by its late author, based in part on bibliographic research by Francis Harper and including definitions and brief statements of the habits and distribution of the orders by J. Eric Hill. Reference to the original description and to illustrations, as well as synonymy, are given for each form. Vernacular names, descriptive matter, information on range and life history, historical notes, and discussion of the causes of reduction also are presented so far as the circumstances in each case permit. The work covers land mammals of the western hemisphere and oceanic mammals of worldwide distribution. The bibliography occupies about 55, and the index 30, pages.

Destruction: Winter losses, bobwhite

Phelps, Chester F. Winter losses of the bobwhite, Virginia Wildlife (Virginia Commission of Game and Inland Fisheries, Travelers Bldg., Richmond. 10 cents a copy), 6(1), Fall-Winter 1942, pp. 18-22, 3 photos, 2 tables.

On an unhunted area, the average winter loss in 21 coveys for 3 years was 43 percent of the fall population. The study area and methods of the investigation are described and the causes of loss discussed. Inadequate cover was the greatest defect in the range and predation by Cooper's and sharp-shinned hawks the most important medium of destruction. Comparison is made with the results of Errington's studies in Wisconsin.

Diseases and Parasites: Chagas' disease

Packchanian, A. Reservoir hosts of Chagas' disease in the state of Texas, Amer. Journ. Tropical Medicine (Williams and Wilkins Co., Baltimore, Md.), 22(6), Nov. 1942, pp. 625-631, 4 figs.

Of a number of small mammals collected, 1 nine-banded armadillo, 8 opossums, 2 house mice, and 32 wood rats were found infected with Trypanosoma cruzi. Some of the wood rats harbored also T. neotoma, sarcosporidia, and microfilaria. The morphology and experimental pathology of the wild strains are indistinguishable from those of T. cruzi from humans. Bibliography of 15 titles.

Diseases and Parasites: clam-poisoning

McKernan, Donald L., and Victor B. Scheffer. Unusual numbers of dead birds on the Washington coast, Condor (W. Lee Chambers, Robinson Road, Topanga, Calif. 50 cents a copy), 44(6), Nov.-Dec. 1942, pp. 264-266.

In May 1942, unusual numbers of drifted up birds were found; a list is given of 127 examined on a 5-mile strip of beach. The relation of the mortality to an epidemic of clam-poisoning is discussed. The authors conclude that: "The available evidence leads to the conclusion that the birds probably were killed by toxic marine organisms of the group Dinoflagellata. It is our belief that small fish and crustacea near the area of occurrence of the red tide had been feeding on a diet excessively rich in organisms of the Gonyaulax type, and that birds subsequently feeding on the fish and (or) barnacles and other shellfish were the victims of secondary poisoning."

Diseases and Parasites: Coccidioidomycosis

Emmons, C. W., and L. L. Ashburn. The isolation of Haplosporangium parvum n. sp. and Coccidioides immitis from wild rodents. Their relationship to coccidioidomycosis, U. S. Public Health Reports (Supt. of Documents, Washington, D. C. 5 cents a copy), 57(46), Nov. 13, 1942, pp. 1715-1727, 4 pls., 1 fig., 3 tables.

"Typical strains of Coccidioides immitis were isolated from the lung in 15 percent of pocket mice and 17 percent of kangaroo rats trapped in the vicinity of San Carlos, Ariz. x x x The frequency of the infection and the character of the lesions support a suggestion that rodents may constitute a reservoir of coccidioidomycosis important in the distribution and epidemiology of the disease in man." The new species isolated from rodents from the same locality is described and figured and its laboratory culture and behavior discussed. Bibliography of 21 titles.

Diseases and Parasites: Encephalomyelitis

Howitt, Beatrice F., and Wm. Van Horick. Relationship of the St. Louis and the western equine encephalitic viruses to fowl and mammals in California, Journ. Infectious Diseases (University of Chicago Press, Chicago, Ill. $2.00 a copy), 71(2), Sept.-Oct. 1942, pp. 179-191, 2 charts, 4 tables.

Neutralization tests with the blood, and tests for virus in certain organs, of wild mammals are reported upon and the possible relation of pheasant stocking to outbreaks of the disease is discussed. Antibodies indicating the presence of the disease were found, but the virus itself was not identified, in the wild mammals examined. References are given to papers treating the relationship of wildlife to encephalomyelitis.

Diseases and Parasites: Fox encephalitis

Barton, J. C., and R. G. Green. Histologic adaptation of the virus of fox encephalitis, Amer. Journ. Hygiene (Prince & Lemon Sts., Lancaster, Pa. $2.00 a copy), 37(1), Jan. 1943, pp. 21-36, 9 tables.

"Inclusion bodies were found principally in the endothelial cells of the cerebro-vascular bed." "The symptoms of encephalitis produced by the virus result from damage to vascular cells and not to nerve cells." Bibliography of 9 titles.

Diseases and Parasites: Ornithosis

Eddie, B., and Thomas Francis, Jr. Occurrence of psittacosis-like infection in domestic and game birds of Michigan, Proc. Soc. for Experimental Biol. and Medicine (A. J. Goldford, College of the City of New York), 50(2), June 1942, pp. 291-295.

The disease was found in all domestic fowl, but in none of the wild game birds, tested (Hungarian partridges, pheasant, ducks).

Diseases and Parasites: Relapsing fever

Davis, Gordon E. Ornithodoros parkeri and relapsing fever spirochetes in southern Idaho, U. S. Public Health Reports (Supt. of Documents, Washington, D. C. 5 cents a copy), 57(40), Oct. 2, 1942, pp. 1501-1503, 1 table.

The first lots of this species of tick received from Idaho were collected in ground squirrel and prairie dog burrows. They had a very high incidence of the spirochetes of relapsing fever; however, this disease has been reported from the human population of the region.

Diseases and Parasites: Tularemia

Hicks, Lawrence E. Rabbits and the prevention of Tularemia in Ohio, Ohio Wildlife Research Station (Ohio State University, Columbus), Release 176, 13 pp., charts, and tables (mimeographed), Dec. 1942.

More than 95% of the human cases of tularemia are contracted through handling diseased rabbits. The affected animals do not live long and as cold stops the activities of the tick vectors, a disease-free season ensues. It is then that rabbit hunting should be done. The present report reviews work on cottontails in Ohio and compares the findings with those obtained elsewhere. The status of the species as game and its population fluctuations are dis-

cussed. The prevalence of tularemia (135 human cases, 17 deaths per year for the last four years), the mental hazard of the disease, and its transmission and control are treated. Postponement of the hunting season (for which there are other arguments) is recommended.

Diseases and Parasites: Rat vectors of

Schwarz, Ernst. Notes on commensal rats, Amer. Journ. Tropical Medicine (Williams and Wilkins Co., Baltimore, Md.), 22(5), Sept. 1942, pp. 577-579.

Distinguishes four, rather than the usual three, forms of commensal rats, the fourth being Rattus r. frugivorus Rafinesque. The relation of rats to plague and the identification of ship rats are discussed. Bibliography of 8 titles.

Diseases and Parasites: Acarina, Haemaphysalis

Eddy, Gaines W. Notes on the seasonal history of the rabbit tick, Haemaphysalis leporis-palustris in Oklahoma, Proc. Entomological Soc. Wash. (L. H. Baumhofer, Bureau of Entomology, Washington, D. C. 50 cents a copy), 44(7), Oct. 1942, pp. 145-149, 1 map.

This carrier of spotted fever and tularemia is widely distributed in both North and South America. Birds as well as mammals serve as hosts and in Oklahoma, where this study was made, it is known to occur on 5 mammals and 2 birds, which are named. Seasonal occurrence is reported and tabulated; low in December, high in June. Bibliography of 9 titles.

Diseases and Parasites: Acarina, Haemaphysalis

Joyce, C. R., and Gaines W. Eddy. Host and seasonal notes on the rabbit tick, Haemaphysalis leporis-palustris, Iowa State College Journal of Science (Ames. $1.00 a copy), 17(2), Jan. 1943, pp. 205-212, 1 fig., 4 tables.

The rabbit tick transmits both spotted fever and tularemia, of which diseases there were 85 and 342 reported human cases in Iowa in the period 1930-39. The table lists 29 species of birds upon which immature stages of the tick were found and gives the degree of incidence. Adults also occur upon birds, some of which are mentioned. Nymphs and larvae infest dogs, cats, groundhogs, and opossums in addition to cottontails which are the principal hosts of the adults. The life-history of the tick is traced and its parasites discussed. Bibliography of 16 titles.

Diseases and Parasites: Acarina, Ixodes

Cooley, R. A., and Glen M. Kohls. Ixodes baergi, a new species of tick from Arkansas (Acarina: Ixodidae), U. S. Public Health Reports (Supt. of Documents, Washington, D. C. 5 cents a copy), 57(49), Dec. 4, 1942, pp. 1869-1872, 3 pls.

Collected on cliffs inhabited by cliff swallows; description, measurements, illustrations, comparative notes.

Diseases and Parasites: Acarina, Trombiculinae

Ewing, H. E. Remarks on the taxonomy of some American chiggers (Trombiculinae), including the descriptions of new genera and species, Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 28(6), Dec. 1942, pp. 485-493, 1 pl.

Of interest in connection with Usonian wildlife are: The proper scientific name for the common North American chigger--Eutrombicula alfreddugesi; and the description and illustration of the following new forms: Trombicula rohweri (from house wren, Mississippi); T. californica (from Thomomys neglectus); Cantacarus n. g. (C. americanus, genotype, from mole, Oregon); C. occidentalis (from squirrel, California); Acomatacarus arizonensis n. g. et sp. (from a lizard); and Walchia americana (from cotton mouse, Florida). Bibliography of 13 titles.

Diseases and Parasites: Bacteria, Mycobacterium

Steinhaus, E. A., and Glen M. Kohls. Isolation of an acid-fast bacillus from a hawk, Journ. Amer. Veterinary Med. Assoc. (600 S. Michigan Ave., Chicago, Ill. 75 cents a copy), 101(789), Dec. 1942, p. 502.

Mycobacterium avium from marsh hawks in North Dakota.

Diseases and Parasites: Bacteria, Salmonella

Hinshaw, W. R., T. J. Taylor, and E. McNeil. Salmonella bredeney infection in birds, Cornell Veterinarian (E. L. Brunett, Business Manager, Ithaca, N. Y.), 32(3), July 1942, pp. 357-359.

This one of a number of species of Salmonella which are known to cause disease in man, in birds, and in other animals. The present paper reviews the literature (7 references given) concerning infections of this bacterium in birds and reports the disease in chukar partridges, turkeys, and ducks in California. "An outbreak of paratyphoid in chukars from which both S. typimurium and S. bredeney were isolated is described."

Diseases and Parasites: Cestoda of reptiles

Hughes, R. Chester, John R. Baker, and C. Benton Dawson. The tapeworms of reptiles. Part III. Proc. Okla. Acad. Sci. (H. J. Harper, Okla. Agricultural and Mechanical College, Stillwater), 22, 1942, pp. 81-89.

This is the concluding number of a series of compilatory articles in which Part I (Amer. Midland Nat., 25, 1941: 454-468) contains "A key to the principal taxonomic groups of reptilian cestodes" and "The species of reptilian tapeworms in systematic outline" and Part II (Wasmann Collector, 4, 1941: 97-104) a "Host catalogue." This installment includes an index of specific names, a 6-1/2-page bibliography, and a few records supplementing the preceding parts.

Diseases and Parasites: Cestoda, Dilepis

Polk, Seigul J. The genus Dilepis Weinland, 1858, Wasmann Collector (University of San Francisco, Calif.), 5(1), April 1942, pp. 25-32.

Lists of valid and invalid specific names, host catalogue; the hosts, with 2 mammalian exceptions, are birds. 2-1/2-page bibliography.

Diseases and Parasites: Common to wildlife and livestock

Shillinger, J. E. Diseases of wildlife and their relationship to domestic livestock, Yearbook of Agriculture, 1942 (1943) (Supt. of Documents, Washington, D. C. $1.75 a copy), pp. 1217-1225, 3 figs.

Discussion of diseases that affect both wildlife and livestock, including: brucellosis, hemorrhagic septicemia, tuberculosis, actinomycosis, malignant edema, tularemia, foot-and-mouth disease, encephalomyelitis, papilloma, and malaria, anaplasmosis, and other maladies caused by parasites, in addition to toxemias due to pollution and food poisoning. Bibliography of 13 titles.

Diseases and Parasites: Diptera, Carnus

Bequaert, J. Carnus hemapterus Nitzsch, an ectoparasitic fly of birds, new to America (Diptera), Bul. Brooklyn Entomological Soc. (J. R. de la Torre-Bueno, 311 E. 4th St., Tucson, Ariz. 75 cents a copy), 37(4), Oct. 1942, pp. 140-149, 1 fig.

From a nestling flicker, New York. Description and illustration of this fly of the family Milichiidae; record of its distribution and hosts; discussion of its bionomics; and bibliography of 35 titles.

Diseases and Parasites: Diptera, Hippoboscidae

Bequaert, J. A monograph of the Melophaginae, or ked-flies, of sheep, goats, deer and antelopes (Diptera, Hippoboscidae), Entomologica Americana (Science Press, Lancaster, Pa.), New Series, 1 (1942): 1, Jan., pp. 1-64, Figs. 1-4; 2, April, pp. 65-124, Figs. 5-11; 3, July, pp. 125-172, Figs. 12-17; 4, Oct., pp. 173-220, Figs. 18-19.

Wild hosts of these flies in North America include mountain sheep, elk, and deer. This treatment is monographic, including keys to the genera, subgenera, and species, synonymy, description, illustration, and full bibliographic references. Available information on life histories, possible disease transmission, and control also is included.

Diseases and Parasites: Nematoda, Skrjabinoptera

Morgan, Banner B. The nematode genus Skrjabinoptera Schulz, 1927, Lloydia (309 W. Court St., Cincinnati, Ohio. $1.00 a copy), 5(4), Dec. 1942, pp. 314-319, Pl. 1, table.

History, generic diagnosis, list of the species, table of comparative measurements, key to 4 species, parasite-host list. (Hosts mostly lizards.) Bibliography of 19 titles.

Diseases and Parasites: Protozoa, Hexamita

Hinshaw, W. R., and E. McNeil. Hexamita sp. from the ring-necked pheasant, Journ. Amer. Veterinary Med. Assoc. (600 S. Michigan Ave., Chicago, Ill. 75 cents a copy), 101(789), Dec. 1942, p. 503.

Cause of epidemic among young birds on a game farm in California.

Diseases and Parasites: Protozoa, Trichomonas

Morgan, Banner B. Host list of the genus Trichomonas (Protozoa: Flagellata), University of Wisconsin (Madison), Dept. of Veterinary Science Compilation No. 1, 9 pp. (mimeographed), 1942.

The hosts of a considerable proportion of the 89 nominal species are vertebrates.

Diseases and Parasites: Siphonaptera

Good, Newell E. Stenistomera (Siphonaptera): a revaluation of the genus, with the description of a new subgenus and species, Proc. Entomological Soc. Wash. (L. H. Baumhofer, Bureau of Entomology, Washington, D. C. 50 cents a copy), 44(7), Oct. 1942, pp. 131-139, Pl. 13.

Description of a new subfamily (Stenistomerinae), subgenus (Miochaeta), and the species which is its type (Stenistomera macrodactyla). The latter is from Peromyscus eremicus, Arizona. Another species (S. alpina) is recorded from Peromyscus and Neotoma in several western states.

Diseases and Parasites: Siphonaptera

Hubbard, C. Andresen. Ten papers on western fleas in which are erected two new genera and fourteen new species. Gathering from Pacific University Bul. (Forest Grove, Oregon), Vol. 37, No. 1, March 1940 to No. 10, May 1941, in all 55 pp., 3 pls., 7 figs.

This collection of writings, besides the original descriptions noted in its title, includes: what amounts to a complete treatise of the fleas of the United States that infest moles and shrews; similar reviews, restricted to the northwest, for fleas of ground-squirrels, conies, and rabbits; revisions of the genera Catallagus, Meringis, Malaraeus, and Micropsylla; and a check list (with host records) of fleas of the Pacific Northwest. The papers deal more or less fully with fleas of the following groups of mammals in addition to those already mentioned: meadow, deer, pocket, grasshopper, tree, red-backed, jumping, and gnome mice, and kangaroo rats.

Diseases and Parasites: Siphonaptera

Hubbard, C. Andresen. A new Thrassis (flea) from California and Oregon; and fleas carried by some of the West's ground squirrels, Pacific University Bul. (Forest Grove, Oregon), 38(6), Aug. 1942, pp. 1-4, 2 figs.

Descriptions and illustrations of Thrassis rockwoodi n. sp., preferred hosts Citellus spp., from 4 northwestern states, type locality, Klitzen, Oreg. Summary of the records by the writer and others of fleas infesting species of the genus Citellus.

Diseases and Parasites: Trematoda of reptiles

Hughes, R. Chester, Joe M. Higginbotham, and Jasper M. Clary. The trematodes of reptiles, Part III, Conclusion. Proc. Okla. Acad. Sci. (H. J. Harper, Okla. Agricultural and Mechanical College, Stillwater), 22, 1942, pp. 90-114.

This is the concluding number in a series of compilatory articles of which Part I (Amer. Midland Nat., 27, 1942: 109-134) contains "The species of reptilian flukes in systematic outline" and Part II (Proc. Okla. Acad. Sci., 21, 1941: 35-43), a "Host catalogue." This installment includes an index of specific names, a 20-page bibliography, and notes supplementing the preceding parts.

Diseases and Parasites: Trematoda, Cryptocotyle

Willey, Charles H., and Horace W. Stunkard. Studies on pathology and resistance in terns and dogs infected with the heterophyid trematode, Cryptocotyle lingua, Trans. Amer. Microscopical Soc. (James E. Ackert, Kansas State College, Manhattan), 61(3), July 1942, pp. 236-253, 2 pls., 1 table.

Although studies of animals in captivity are not ordinarily abstracted in WILDLIFE REVIEW, this article is noted because it contains references to natural infections in terns, gulls, and occasionally other fish-eating birds and mammals, and a useful bibliography (24 titles).

Diseases and Parasites: Of dove, mourning

Harkema, Reinard. The mourning dove, a new host of the anoplocephalid tapeworm, Aporina delafondi (Railliet), Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 28(6), Dec. 1942, p. 495.

Five of 31 individuals from Wake County, N. C., were parasatized.

Diseases and Parasites: Of fur animals

Shillinger, J. E. Diseases of fur animals, Yearbook of Agriculture 1942(1943) (Supt. of Documents, Washington, D. C. $1.75 a copy), pp. 1232-1238, 2 figs.

Diseases, prevalence, symptoms, and control of which are commented upon, include: paratyphoid, infectious enteritis, distemper, anthrax, infestations of both internal and external parasites, and nutritional deficiencies.

Diseases and Parasites: Of game birds

Shillinger, J. E. Diseases of farm-raised game birds, Yearbook of Agriculture 1942 (1943) (Supt. of Documents, Washington, D. C. $1.75 a copy), pp. 1226-1231, 1 fig.

An article shortened by references to other sections of the Yearbook containing accounts of poultry diseases and their control. The maladies discussed are pullorum disease, ulcerative enteritis, blackhead, coccidiosis, trichomoniasis, aspergillosis, thrush, infestations by parasitic worms, and nutritional deficiencies. Bibliography of 7 titles.

Diseases and Parasites: Of mammals

Goble, Frans C., and Arthur H. Cook. Notes on nematodes from the lungs and frontal sinuses of New York fur-bearers, Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 28(6), Dec. 1942, pp. 451-455, 1 map, 1 table.

Incidence of infestation of 7 kinds of parasites in more than 650 individuals representing 10 species of mammals is tabulated. Literature bearing on the subject of the paper is reviewed and 12 titles are cited.

Diseases of Parasites: Of moose

Fenstermacher, R., and O. Wilford Olsen. Further studies of diseases affecting Moose III. Cornell Veterinarian (E. L. Brunett, Business Manager, Ithaca, N. Y.), 32(3), July 1942, pp. 241-254.

Detailed autopsies of 5 observably abnormal individuals and discussion of these and previous findings involving a total of 31 animals. One of the present lot was affected with brucellosis and another had died as the result of an extremely heavy infestation of liver flukes. Bibliography of 8 titles.

Diseases and Parasites: Of moose

Fenstermacher, R., and O. Wilford Olsen. Diseases affecting moose, Conservation Volunteer (Minnesota Dept. of Conservation, St. Paul), 5(27), Dec. 1942, pp. 46-48.

Report on autopsies of 5 animals observed to be ailing condensed from an article in the Cornell Veterinarian for July 1942. Defective vision, brain disorders, and parasitization by ticks, cestodes, trematodes, nematodes, and bacteria were the abnormalities disclosed.

Diseases and Parasites: Of moose

Olsen, O. Wilford, and Reuel Fenstermacher. Parasites of moose in northern Minnesota, Amer. Journ. Veterinary Research (600 S. Michigan Ave., Chicago, Ill. $1.25 a copy), 3( ), Oct. 1942, pp. 403-408, tables.

Review of literature (26 titles cited); discussion of the forms occurring most frequently; tabulation of the parasites showing sites and frequencies; key for field identification of the known parasites of moose.

Diseases and Parasites: Of muskrat

Penn, George H., Jr. Parasitological survey of Louisiana muskrats, Journ. Parasitology (Science Press, Lancaster, Pa.), 28(4), Aug. 1942, pp. 348-349.

Notes on the occurrence of 13 species of parasites (external and internal) as revealed by examination of nearly 1,800 carcasses.

Ecology: Availability of weed seeds and shattered grain

Baumgras, Philip S. Winter food productivity of agricultural land for seed-eating birds and mammals, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(1), Jan. 1943, pp. 13-18, 2 figs., 2 tables.

The author reports on the quantity of weed seeds of several species available on standing plants by fall to spring months in various types of fields. [The reviewer suggests that during most of the winter the amount on the ground would be much greater. Availability to consumers would vary with the depth of snow.] Author's summary: "(1) Foods on an area of agricultural land in Michigan were sufficient to supply the winter needs of the wildlife population; (2) wheat stubble fields were especially productive of ragweed seeds, averaging 205 pounds per acre in October; (3) soil fertility and weed seed production are directly related; (4) because of the adequate and available supply of weed seeds and grains throughout the winter, competition between game and other species was of minor consequence; (5) corn is a major wildlife food. Cornfields picked with a mechanical picker yielded, after harvest, an average of 6.7 bushels of shelled corn per acre. Most of this was salvaged by livestock; the remainder was used by wildlife; (6) wheat fields cut with a tractor-drawn binder yielded 2.4 bushels of waste grain per acre and oat fields 3.5 bushels per acre. These were used mainly by starlings and blackbirds but to some extent by pheasants and ducks; (7) the mast crop in 1940 was almost a total failure, yet fox squirrels survived the winter in good condition, probably because of an available supply of shocked corn." Bibliography of 6 titles.

Ecology: Populations, bats

McClure, H. Elliott. Summer activities of bats (Genus Lasiurus) in Iowa, Journ. Mammalogy (Ernest T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 23(4), Nov. 1942, pp. 430-434, 1 fig.

Report upon unusual observations, bearing upon litter size and roosting habits. Counts indicated a population of one bat per acre and one family to 4.5 acres; the average number of young red bats to a female was 2.3. The peak of abundance was during the week of July 24.

Ecology: Populations, rodent

Linduska, J. P. Winter rodent populations in field-shocked corn, Journ. Wildlife Management (~~Io~~gan J. Bennett, 206 Forestry Bldg., State College, Pa. 75 cents a copy), 6(4), Oct. 1942, pp. 353-363, 7 figs.

Description of study area, list of its mammal inhabitants, account and illustration of the method used in studying shock populations, discussion of the economic considerations involved, and notes on the life histories of deermice, woodmice, and meadow voles. Author's summary: "Rodent populations inhabiting corn shocks on a southern Michigan farm in January, 1941 have been studied. The average minimum population was 1.5 mice per shock. In shocks left standing in corn fields until April, 17 percent of the corn was consumed; from shocks placed in fields covered with sod 46 percent of the corn was removed by mice. The prairie deermouse proved to be most common in high, well-drained situations, and the meadow vole in low, moist areas. Woodmice, common in nearby woodlots, were taken but sparingly in the corn fields. Daily movements of both the prairie deermice and meadow voles that lived in corn shocks were greatly restricted, presumably because of the abundance of food and cover. Mid-winter breeding was common in both the meadow vole and prairie deermouse, and one of three female woodmice examined was pregnant. The factors responsible for this unseasonal breeding are not readily apparent. Female prairie deermice began breeding when about 15 grams in weight and the female meadow voles at about 20 grams. A rapid recovery from a seasonal (summer) low in population was made in this area by the meadow vole during the winter of 1940-41." Bibliography of 22 titles.

Ecology: Of beaver

Grimm, Wm. C. Beaver dams and wildlife, Pennsylvania Game News, (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 13(11), Feb. 1943, pp. 10-11, 30, 5 photos.

Virtually exterminated in early days, beavers were re-established by restocking and protection. Some damage to man's interest is being done by flooding but the beaver ponds are a boon to wildlife. Special reference is made to one in Crawford County. Author's conclusions: "In Northwestern Pennsylvania, at least, the beaver, through its activities, exerts a beneficial effect upon many species of wildlife: (1) By regulating the flow of water and impounding it behind dams it materially lessens the disastrous effects of drought upon all wildlife; (2) by impounding water to form shallow lakes and marsh areas, it thereby provides habitat suitable for many species of wildlife including the muskrat, gallinule, wild ducks, rails, and a number of other marsh-inhabiting birds."

Ecology: Of grouse, ruffed

Polderboer, Emmett B. Cover requirements of the eastern ruffed grouse in northeast Iowa, Iowa Bird Life (Fred J. Pierce, Winthrop, Iowa. 25 cents a copy), 12(4), Dec. 1942, pp. 50-55, 1 pl., 2 tables.

The ruffed grouse now occurs in only a half-dozen counties in northeastern Iowa. This study was directed toward learning the factors that maintain the birds in this limited range. In the site of the investigation, the following cover types were of greatest value in the order named: "Poplar consociations, 10-20 year-old oak-hickory forest, 5-10 year-old clearings, advanced oak-hickory forest, and 20-35 year-old oak-hickory forest." The author's summary continues: "Cover type groups utilized as loafing cover in order of importance were: Second growth clearings, advanced forest, and mature forest. Most of the roosts found were on the ground. Winter roosts were chiefly under dogwoods in maple-linden communities on north and east slopes when no snow was on the ground. Following heavy snows the preponderance of winter roosts was found in clearings and in second growth oak-hickory communities. Drumming logs selected by male grouse ranged from 10-24 inches in diameter and from 7-40 feet in length, without preference discerned for any age class, location, or type of surrounding cover. Three nests were found, each within six yards of an open road or path, in mature and advanced white oak woods with an abundance of leaves on the forest floor. Both upland and valley clearings, containing an abundance of brambles, located near maple-linden communities were used as brood cover. Molting cover, in maple-linden woods and clearings in shaded ravines, was used extensively Aug. 15-Sept. 15. Pastured woodlands, combined with open grass pastures in valleys, held grouse under grazing pressure as intense as one head of stock to 5 acres. Woodlands with undergrowth shrubs of a density of less than three shrubs to the square yard and a density of more than 50 mature trees to the acre were not suitable to the grouse. Burning in the spring destroyed the desirable nesting habitat in two-thirds of the Lansing area. Fall burning of one-fifth of the area concentrated the grouse in a smaller amount of loafing cover but did not affect their feeding range to any extent."

Ecology: Of grouse, sharp-tailed

Aldous, Shaler E. Sharp-tailed grouse in the sand dune country of North-central North Dakota, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(1), Jan. 1943, pp. 25-31, 2 pls., 1 fig., 1 table.

Author's summary: "(1) The sand dune areas of north-central North Dakota provide ideal habitats for upland game birds, particularly the sharp-tailed grouse. Pinnated grouse, Hungarian partridges, pheasants, white-tailed deer, jack rabbits, and cotton-tails also are present; (2) sharp-tailed grouse are essentially resident throughout the year as shown by trapping and banding experiments. Their daily and seasonal movements, are usually for short distances; (3) the time when morning feeding begins accords closely with sunrise time; (4) the autumn food includes insects, weed seeds, small grains, and small quantities of buds. In winter the insect diet is drastically reduced and the seeds eaten are mostly those of wolfberry and wild rose. Buds make up

the bulk of the winter food and are almost entirely those of Salix, Populus, Prunus, and Amelanchier; (5) two cestode parasites and one species of louse were identified from the sharp-tailed grouse; (6) management suggestions include: Elimination of grazing from the dunes; mowing of wild hay only after the nesting season; planting of good food and cover species on and around the dunes; and the provision of watering places where at present they are too widely separated." Population estimates are given for the game species named. The food items identified from 19 gizzards and 6 crops collected in autumn and 15 gizzards and 15 crops in winter are tabulated. Maximum, minimum, and average weights are stated and a few breeding records detailed.

Ecology: Of prairie chicken

Mohler, Levi L. How farm and settlement affect Nebraska's prairie chickens, Outdoor Nebraska (Nebraska Game, Forestation, and Parks Commission, Loncoln), 20(4), Nov. 1942, pp. 8-9, 23, 2 photos.

Homesteading of small tracts and farming of land that should never have been plowed ruined much prairie chicken range. Drought, though directly injurious to the birds, was indirectly beneficial in eliminating small sandhill farms. At present, farms there average 1,000 acres. In the State, as a whole, prairie chickens occur chiefly where the farms range from 6 to 12 hundred acres in size and where there are enough cultivated crops to provide winter food and enough grassland to meet the roosting and nesting requirements of the species. "Barring future sweeping changes in land use, it seems likely that most of Nebraska's prairie chicken population in the coming years will be confined to a southwest-to-north-central belt of sandhill borderland which is less than 50 miles in width in the southwest and about 100 miles wide in the north-central part. From the upland game standpoint, Nebraska is fortunate in having a vast grassland area which provides conditions which are lacking in most of the rest of the State."

Ecology: Of raccoon

Yeager, Lee E., and R. G. Rennels. Fur yield and autumn foods of the raccoon in Illinois River bottom lands, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(1), Jan. 1943, pp. 45-60, 1 fig., tables.

Authors' summary: "The fur yield and fall foods of raccoons were studied in 1939 and 1940 on the Pere Marquette Area, a river bottom habitat of four square miles in southwest Illinois. Trappers reportedly took 170 raccoons during the fall and early winter of 1939-40, a yield of 42.5 per square mile. Such high density was apparently due to the natural excellence of the habitat, its location between and just above the confluence of the Mississippi and Illinois rivers, and to extensive clearing a few miles upstream during the winter of 1938-39. In 1940-41 trappers reported a catch of 60 raccoons, believed to represent approximately the annual increase of a more nearly normal population on the four square miles of probably optimum habitat.

"Four collections totalling 419 scats were made, one in each year before and another after opening of the waterfowl hunting season. The four

collections were made from practically the same logs and stumps, and amounted to 104.7 scats per square mile. The vegetable food was 72.4 per cent and animal food 27.6 percent of the total fecal bulk. Persimmons, pecans, wild grapes, pokeweed berries, and corn, in the order named, were the chief vegetable foods; crayfishes, insects, birds, snails, fishes, and mammals were the principal animal foods. The effect of availability, seasonal or otherwise, was clearly apparent in the quantity and kinds of food taken. Scats collected before the opening of the waterfowl season contained much less bird material than those taken a few weeks subsequently. Pre-hunting scats contained no duck remains, but in the post-hunting series, remains of mallard, pintail, and wood duck were 89 per cent of the bird material in 1939, and 76 per cent in 1940. Long-range shooting and ineffective retrieving appeared to be largely responsible for the availability of ducks to raccoons."

The authors describe and map the habitat, give an account of its flora. The food habits presentation is detailed, all food items being tabulated. Bibliography of 9 titles.

Economics: Fur, Michigan

Baumgartner, Luther L. Fourteen years' wild-fur harvests, Michigan Conservation (Michigan Dept. of Conservation, Lansing), 11(11), Dec. 1942, pp. 4-5, 5 photos, 1 graph, 1 table.

Tabulation of numbers of 13 groups of fur animals reported taken in Michigan by years from 1928 to 1942 and of their approximate values. The average number is some 800,000, and the approximate value $1,490,820. Muskrats far exceed all other species combined; skunks are second in numbers.

Economics: Fur, Minnesota

Highby, Paul R. The 1941 fur catch, Conservation Volunteer (Minnesota Dept. of Conservation, St. Paul), 5(28), Jan. 1943, pp. 40-43.

The catch exceeded a million pelts worth about two million dollars. Those of muskrats were taken in preponderant numbers. The effects of muskrat seasons at different times of year are discussed; population recovery is prompt after fall trapping but much retarded after a spring trapping season. Animals following the muskrat in the order of their fur value were the mink, skunk, beaver, weasel, raccoon, and red fox.

Economics: Fur, Wyoming

Bagley, Lester, and Nedward M. Frost. Economic aspects of the Wyoming fur trade, Wyoming Wild Life (Wyoming Game and Fish Commission, Cheyenne), 7(11), Nov. 1942, pp. 1-8, 17-19, tables.

The volume and economic significance of the early fur trade have been generally overestimated, while on the other hand the amount and value of the present-day trade are greatly undervalued. The fur trade has never ceased to be of economic importance in the Northwest and particularly in Wyoming. Geographic advantages and comparative friendliness of the Indians favored trapping in that State. A balance sheet for the fur trade at St. Louis, 1815-1830

is presented and general information is given on the business in the Northwest. Estimates are made of the proportion of the furs coming from Wyoming and of their value in modern dollars. The past and prospective values of beavers are especially emphasized. Bibliography of 10 titles.

Economics: Fur animals, Texas

Lay, Daniel W., and O. Earl Frye. Fur resources and fur animals of Texas, Bul. 25, Game, Fish, and Oyster Commission (Austin, Texas), 42 pp., illus., 5 tables, Dec. 1942.

In 1941, seventeen thousand persons received an average of $38 each for furs trapped in Texas. There has been a decline in the catch in recent years, however, and better protection and management are needed to improve the situation. This bulletin includes sections on: fur laws; trapping, preparing, and marketing furs; management of fur animals; fur farming; harvesting the fur crop; fur bearers as predators; and fur animals of Texas. The last-named chapter treats 17 species, giving for each a brief description, statement of its distribution in Texas, and comment on its food, haunts and habits, and economic importance. A few others are briefly mentioned. Bibliography of 12 titles.

Education: Conservation

Fink, Ollie E., et al. Conservation for tomorrow's America, Ohio Division of Conservation and Natural Resources (Columbus. 50 cents a copy), 144 pp., illus., 1942.

A comprehensive and excellently prepared guide to the teaching of conservation in Ohio schools. Wildlife receives attention in sections entitled, "Nature's restoring steps," "Bring them back alive--with the raindrops," "Activities--learn by doing," "Let's form a 'what is it?' club," "Let us study a good conservation practice," "Wildlife programs and projects," and others. The publication includes check lists of Ohio vertebrates and partial lists of woody plants and insects. Usable publications available from the Superintendent of Documents, Washington, D. C., are listed; a classified bibliography is given; and suggestions are made as to visual aids, apparatus, and materials.

Education: Wildlife management

Elliott, Charles N. Careers in wildlife management, Occupational Monograph No. 29 (Science Research Associates, 1700 Prairie Ave., Chicago, Ill.), 48 pp., illus., 1942.

Information as to how training in wildlife management may be obtained. Chapter headings are: What wildlife has meant to man, Federal wildlife workers, State jobs in wildlife, Private careers in wildlife, Wages and training for wildlife jobs, and The future of wildlife management. The number of persons employed in all phases of wildlife work is estimated at 222,800 (p. 12). Colleges that have undergraduate courses in wildlife management are listed (pp. 42-44), as well as institutions, including the Cooperative Wildlife Research Units, that give graduate work (pp. 44-45).

Food Habits: Damage to aspen

Packard, Fred M. Wildlife and aspen in Rocky Mountain National Park, Colorado, Ecology (Prince and Lemon Sts., Lancaster, Pa. $1.50 a copy), 23(4), Oct. 1942, pp. 478-482, 1 map.

Aspen the only abundant deciduous tree in the Park is undergoing a decline due to infection by a number of fungi and to attacks by animals. These not only cause direct, but also indirect, damage through facilitating entrance of fungal spores. The elk, mule deer, and beaver are the most prominent species affecting the welfare of aspen, but small mammals are of some, and woodpeckers, especially sapsuckers, of considerable, importance. Extirpation of the aspen is foreseen.

Food Habits: Damage to tree seedlings

Ostrom, C. E. Frost and rabbits as well as deer destroy tree seedlings, Allegheny Forest Experiment Sta. (Philadelphia, Pa.), Technical Note 33, 2 pp. (mimeographed), 1942.

By the use of exclosure and check plots, 1934-1941, it was learned that rabbits are considerably more destructive to seedlings than are deer. The experiments did not produce information on the actual extent of damage by deer.

Food Habits: Nutritional value of crown sprouts

Reynolds, Hudson G., and Arthur W. Sampson. Chaparral crown sprouts as browse for deer, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(1), Jan. 1943, pp. 119-122, 1 pl., 1 fig., 1 table.

Authors' summary: "Black-tailed deer in browsing tend to favor areas of brush with an abundance of young, succulent crown sprouts. These have a higher nutritional content than older growth stages of the same plants, and continuous cropping by deer keeps the sprouts in younger growth stages. Accordingly, the deer are instrumental in producing a desirable food supply for themselves, once crown sprouting has been induced. The sprouts are, however, subject to limitations; if browsed too closely the plants are killed in a few years, and if not browsed enough the shoots soon become harsh and unpalatable, and then are not sought by deer. A management technique is suggested for benefiting deer on chaparral and other areas, affording a palatable vegetative cover which sprouts when cut or burned." Chemical analyses of crown sprouts and other leafy stems of Adenostoma fasciculatum are presented. Bibliography of 7 titles.

Food Habits: Small mammals vs. spruce sawfly

Morris, R. F. Preliminary notes on the natural control of the European spruce sawfly by small mammals, Canadian Entomologist (Prof. A. W. Baker, Ontario Agricultural College, Guelph, Ontario, Canada), 74(11), Nov. 1942, pp. 197-202.

Reference is made to small mammal depredations upon the larch sawfly and Japanese beetle, and the evidence relating to similar attacks upon the European spruce sawfly (Gilpinia hercyniae) in eastern Canada is summarized. From 40 to 50 percent of the cocoons of this insect are attacked by small mammals, among which the cinereous shrew, red-backed vole, and white-footed mouse probably are most effective. The author's studies of mammalian populations are described in general terms; dry sites with ample cover are most densely inhabited. Populations and the degree of control exercised by them are highest in fall. Bibliography of 9 titles.

Food Habits: Utilization of Berberis bealei

Petrides, George A. Berberis bealei as a spring food of songbirds, Auk (J. Fletcher Street, 1120 Locust St., Philadelphia, Pa. $1.00 a copy), 60(1), Jan. 1943, pp. 99-100.

Observations in Washington, D. C., of 7 species of birds feeding on the fruit of this Chinese species.

Food Habits: Utilization of pine seeds

Smith, Clarence F. Relationship of forest wild life to pine reproduction, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(1), Jan. 1943, pp. 124-125.

Lists of mammals and birds known to feed upon the seeds of Pinus ponderosa, P. jeffreyi, and P. lambertiana.

Food Habits: Utilization of sassafras

Meanley, Brooke. Utilization of sassafras by birds, Maryland Conservationist (514 Munsey Bldg., Baltimore, Md.), 19(4), Fall 1942, p. 20.

Observations on the Patuxent Research Refuge, Md., together with notes from files of the Fish and Wildlife Service.

Food Habits: Of armadillo

Newman, Coleman C., and Rollin H. Baker. Armadillo eats young rabbits, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 23(4), Nov. 1942, p. 450.

Polk County, Texas; field observation.

Food Habits: Of badger

Snead, Edwin, and George O. Hendrickson. Food habits of the badger in Iowa, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 23(4), Nov. 1942, pp. 380-391, 1 pl., 4 tables.

Badgers have increased greatly in Iowa since 1900 and their economic status, therefore, has renewed interest. This study of the food, by the frequency of occurrence method, is based upon more than 200 scats from Boone

and Lyon counties. The results are presented on a seasonal basis. Leading items were ground squirrels, mice, cottontail, and insects.

Food Habits: Of beaver

Beer, James. Notes on the winter food of beavers in the Palouse Prairies, Washington, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 23(4), Nov. 1942, pp. 444-445, 2 tables.

Summary of observations during two winters; aspen and willow bark and twigs and cat-tail rootstocks and shoots were the principal foods. The table records utilization of aspens in relation to their numbers and size classes. It was found that each beaver cut about .4 cord of aspen and .12 cord of willow for the winter. This comprised 65 percent of the food. If these woody plants had been used exclusively, about .8 cord would have been required to supply the needed amount of food.

Food Habits: Of bobwhite

Lett, Robert W., and Allen M. Pearson. Foods of the Piedmont quail, Alabama Conservation (Alabama Dept. of Conservation, Montgomery. 5 cents a copy), 14(6), Dec. 1942, pp. 7, 12, 13, 3 figs., 1 table.

Report upon the contents of some 600 crops collected in the piedmont (east-central) region of the State. Agricultural conditions there and the foods are discussed. The most important items were cowpeas and common lespedeza seeds.

Food Habits: Of bobwhite

Pearson, Allen M., and Henry H. Howell. Quail of the limestone valleys like legumes, Alabama Conservation (Alabama Department of Conservation, Montgomery. 5 cents a copy), 14(7), Jan. 1943, pp. 5, 15, 3 figs., 1 table.

Description of the section (northern) of the State involved and report upon the contents of 200 quail crops collected there. More than half (55 percent) of the total food in them was composed of seeds of legumes of which the most important was common lespedeza. Acorns were next in rank according to volume of consumption.

Food Habits: Of fox, red

Eadie, W. Robert. Food of the red fox in southern New Hampshire, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), Jan. 1943, pp. 74-77, 1 table.

A report based upon analyses of 313 droppings of the red fox collected in southern New Hampshire from October 1939 to October 1940. The remains of mammals were slightly more frequent in the winter scats and of vegetable material in the summer droppings. Field mice far exceeded any other items of mammal food, of which they comprised approximately 57 percent. Bird remains

were found in 35 percent of the scats, and contrary to game-bird hunters' belief, ruffed grouse occurred in only 2.5 percent of the droppings. The frequency of occurrence of all food items is tabulated for two seasons: October-April, and May-September.

Food Habits: Of grosbeak, rose-breasted

Stephens, T. C. Feeding habits of the rose-breasted grosbeak, Iowa Bird Life (Fred J. Pierce, Winthrop, Iowa. 25 cents a copy), 12(4), Dec. 1942, p. 60.

Eating sumac beetles (Blepharida rhois, protectively colored) and seeds of catalpa.

Food Habits: Of grouse, blue

Beer, James. Food habits of the blue grouse, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(1), Jan. 1943, pp. 32-44, 4 figs., 2 tables.

Author's summary: "(1) Stomachs of 128 blue grouse from seven counties in Washington, two in Idaho, and one in Oregon were examined. Also 58 samples of droppings from three counties in Washington and two in northern Idaho were examined in the laboratory and many others in the field. All were analyzed volumetrically; (2) parts of plants of 69 genera are known to be eaten by the blue grouse and representatives of 45 of these were found in the stomachs examined. Plant foods of 16 genera and 27 species are here reported for the first time; (3) the yearly food comprised 98.3 per cent of plant foods and 1.7 per cent of animal matter. Of this 63.8 per cent is needles, 17.0 per cent berries, and 17.2 per cent miscellaneous plant materials; (4) little animal matter is taken by adults, but the food of the young is entirely of insects at first; by the middle of August it becomes the same as that of the adults; (5) the birds have three feeding periods. The first early in the morning, the second just before noon, and the third and heaviest during the last three hours of daylight; (6) free drinking water is not necessary for the blue grouse; (7) the distribution of the genus Dendragapus appears to be limited by that of the plant genera Abies and Pseudotsuga." Discussion of the vegetable foods is by plant families in systematic sequence. Grit and water requirements are discussed, as are also ecology and limiting factors. Bibliography of 22 titles.

Food Habits: Of grouse, ruffed

Merritts, Helen V. What grouse eat during the hunting season, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 13(11), Feb. 1943, pp. 6, 28, 3 figs., 3 tables.

Report on contents of 112 crops collected in November 1940 and comparison with previously published results. Tabulation of food items, of which products of dogwood, willow, aspen, hackberry, and greenbrier were most important by bulk.

Food Habits: Of heron, great blue

Packard, Fred M. Predation upon Wilson's phalarope by Treganza's heron, Auk (J. Fletcher Street, 1120 Locust St., Philadelphia, Pa. $1.00 a copy), 60(1), Jan. 1943, p. 97.

Single observation by the author in Colorado.

Food Habits: Of kangaroo rat

Monson, Gale. Food habits of the banner-tailed kangaroo rat in Arizona, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(1), Jan. 1943, pp. 98-102, 1 fig., 3 tables.

Analyses and tabulation of the items identified from stores in 65 dens examined in Cochise County, Arizona. Storage varied seasonally, being highest in winter. The plants principally used were Rothrock grama (a short-lived perennial) and various annual grasses. Data are given on the measurements of dens, and on their kangaroo rat and commensal occupants.

Food Habits: Of limpkin

Cottam, Clarence. Supplementary notes on the food of the limpkin, Nautilus (Horace B. Baker, 38th & Woodland Ave., Philadelphia, Pa. 50 cents a copy), 55(4), April 1942, pp. 125-128.

Review of literature (6 titles) cited, quotation of field notes by A. Wetmore as to method of feeding; the bird feeds almost entirely upon snails of the genera Pomacea and Viviparus.

Food Habits: Of owl, burrowing

Longhurst, Wm. M. The summer food of burrowing owls in Costilla County, Colorado, Condor (W. Lee Chambers, Robinson Road, Topanga, Calif. 50 cents a copy), 44(6), Nov.-Dec. 1942, pp. 281-282.

In 81 pellets, locustids, carrion beetles, and mice had the higher frequencies of occurrence; detailed findings are tabulated.

Food Habits: Of owl, horned

Alcorn, J. R. Notes on the food of the horned owl near Fallon, Nevada, Condor (W. Lee Chambers, Robinson Road, Topanga, Calif. 50 cents a copy), 44(6), Nov.-Dec. 1942, pp. 284-285.

In 55 pellets, ground squirrel and cottontail remains predominated; notes are given also on other evidences of food found on and near the nest.

Food Habits: Of owls

Price, Homer F. Contents of owl pellets, American Midland Naturalist (Notre Dame, Ind. $1.00 a copy), 28(2), Sept. 1942, pp. 524-525.

Report on the contents of small lots of pellets of 5 species of owls collected in northeastern Indiana and northwestern Ohio.

Food Habits: Of pelican, white

Alcorn, J. R. Observations on the white pelican in western Nevada, Condor (W. Lee Chambers, Robinson Road, Topanga, Calif. 50 cents a copy), 45(1), Jan.-Feb. 1943, pp. 34-36.

The author treats migration, distribution, numbers, and food, and compares his findings with those of Hall (Condor, 27, 1925:147-160) and Bond (ibid., 42, 1940:246-250). The food habits data were derived from identification of fishes regurgitated on nesting grounds and from analyses of 18 stomach contents. Scientific names of the food items are given. "Hall in 1924 at Anaho Island found that 3 percent (by numbers) of the fishes eaten by pelicans were what may be considered food fishes for humans. Bond in 1940 at the same place found that 11.4 per cent were food fish. The findings of Hall and Bond at Anaho Island are in sharp contrast to the data obtained in the vicinity of Fallon where 81 per cent of the fishes found in pelicans' stomachs were food fish."

Food Habits: Of rabbits, jack, forage consumption

[Arnold, J. F.] Forage requirements of range vegetation by jack rabbits, 52nd Ann. Rep. Arizona Agr. Expt. Sta. (Tucson), (1941) 1942, pp. 45-46, table 10.

Advance information upon the results of a 3-year study. "It is estimated that the daily forage consumption of twelve antelope jack rabbits or sixteen California jack rabbits is equivalent to the amount of air-dry forage consumed by one range sheep per day. The amount of forage removed by the daily feeding of sixty antelope or eighty California jack rabbits is equal to [that taken by] one range cow."

Food Habits: Of sora

Wilke, Ford, and Brooke Meanley. Fluctuation in the fall food of the sora rail, Maryland Conservationist (514 Munsey Bldg., Baltimore, Md.), 19(4), Fall 1942, p. 13, 1 graph, 1 table.

Report on analyses of the contents of 25 stomachs collected in the Patuxent marshes, Maryland, in September. Seeds of wildrice and of smartweeds were the preponderating food items.

Food Habits: Of turkey

Kozicky, Edward L. Pennsylvania wild turkey food habits based on dropping analysis, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 13(8), Nov. 1942, pp. 10-11, 28-29, 31, 5 figs., 6 tables.

Review of previous papers on the study of game bird food habits by this method (bibliography of 7 titles). Discussion of its limitations and descrip-

tion of the technic of the author's investigation. Seven hundred and seventy droppings were analyzed and the results are tabulated and commented upon by seasons. There are also reports on the contents of 9 crops and 14 gizzards. Acorns were the leading item in both. From the author's summary: "Natural foods that were taken all four seasons of the year were as follows: (1) Acorns, (2) grasses and sedges, (3) wild grapes, (4) dogwood, (5) wild cherry, and (6) snails. Acorns and wild grape were the two main winter foods. Acorns, grasses, and sedges constituted the important spring foods. Grasses, sedges, huckleberries, insects, wild grapes, and acorns constituted the important summer foods. The main fall foods consisted of acorns, grasses, black gum, flowering dogwood, sedges, herbaceous material, wild grapes, and huckleberries."

History: Sea otter trade

Ogden, Adele. The California sea otter trade, 1784-1848 (University of California Press, Berkeley. $2.50 a copy), 251 pp., col. frontispiece and 2 other pls., 1941.

A report based on extensive research in documents and manuscripts. The author briefly treats the life history of the sea otter and describes the Aleut method of hunting the animal. She traces the history, methods, and results of sea otter capture and trade by the Spanish, Yankees, and Russians and under Spanish, Mexican, and American regimes. The otters "were most numerous until about the year 1815"; in 1811, nine thousand three hundred and fifty-six skins are known to have been obtained. Decrease was rapid after the 1830's, and in the 1900's extinction was considered inevitable. The recent discovery of small herds gives an opportunity for preserving and increasing the species. An appendix contains information about vessels engaged in the sea otter trade and their movements. Documentation is shown by chapters and there is also a 14-page bibliography.

Introductions: English sparrow; starling

Wing, Leonard. Spread of the starling and English sparrow, Auk (J. Fletcher Street, 1120 Locust St., Philadelphia, Pa. $1.00 a copy), 60(1), Jan. 1945, pp. 74-87, 4 figs., 4 tables.

Report from the author's studies of the Bird-Lore Christmas bird censuses. The starling is not limited to low altitudes but has reached areas more than 6,000 feet above sea level. The spread has been more rapid through the southern and south-central states than in the north. The rate of spread was fastest in the 26-30 years succeeding its introduction. The English sparrow spread faster and its occupation was substantially completed in 40 years; that of the starling is far from finished 50 years after the bird's introduction. Characteristics of advent and colonization are discussed. The number of these birds in the United States is estimated at 50 millions for the starling and 150 millions for the "sparrow", constituting 1.00 and 3.00 percent of the breeding, and 1.50 and 4.50 percent of the wintering populations, respectively.

Introductions: Partridge, Hungarian

Viehmeyer, Glenn. The Hungarian partridge and its range in northern Nebraska, Nebraska Bird Review (F. W. Haecker, 506 South 52nd St., Omaha, Nebr.), 10(2), July-Dec. 1942, pp. 37-43.

The exotic and American ranges of the species are outlined and its favorite habitat noted; plumage, call, flight, habits, and life history of the bird are treated; record of its introductions in Nebraska (1907-31) is given and its present status discussed. The partridge is established in several north-central counties and is, apparently, increasing.

Life Histories: Antelope

Bridge, Max. Notes on the pronghorn, Wyoming Wild Life (Wyoming Game and Fish Commission, Cheyenne), 7(11), Nov. 1942, pp. 20-22, 23, 1 photo.

Refers to numbers, in all, and in Wyoming; to shedding of the horns, excellent vision, speed, rump patch, home range, hardiness, use of succulent foods and water, hazards connected with snow, and importance of the coyote as an enemy.

Life Histories: Beaver

Johnson, George B. The beaver, Virginia Wildlife (Virginia Commission of Game and Inland Fisheries, Traveler's Bldg., Richmond, 10 cents a copy), 6(1), Fall-Winter,1942, pp. 28-34, 7 photos, 1 map.

Description and life history of the beaver written in an original and interesting way. In 1930 a survey did not reveal a single beaver in Virginia; the animal has now been restocked in 16 counties and is rapidly spreading.

Life Histories: Beaver

Robb, Donald L. A beaver census in Algonquin Provincial Park, 1939-1940, Canadian Field-Naturalist (C. H. D. Clarke, National Parks Bureau, Ottawa, Canada. 25 cents a copy), 56(6), Sept. 1942, pp. 86-90, 2 photos.

Full description of the methods of the census which was on a sample plot basis. The probable number of fresh beaver houses in the Park is 2,204. The animals were concentrated in the center of the park and were notably scarcer adjacent to boundaries (due to poaching?). The habitat; dams, and lodges are described and careful notes on foods presented. The following were much sought: grasses, leaves of maple and raspberry, roots of yellow water-lily, and barks of white and yellow birches and of aspen. In burned-over areas, where conditions favored regeneration of conifers, the beavers tend to eat out the food supply; in hardwood forests their tenure appeared to be longer.

Life Histories: Deer, White-tailed

Cook, David B., and W. J. Hamilton, Jr. Winter habits of white-tailed deer in central New York, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. 75 cents a copy), 6(4), Oct. 1942, pp. 287-291, 1 pl.

Description of the range in once farmed land now reverting to forest and of the habits of the deer there in response to cover, food, and weather. Specific information on food is given. Authors' conclusions: "The deer in central New York are still increasing rapidly. In winter they congregate on certain favorable south and southeast slopes that are protected from wind and where the sun keeps the snow at minimum depth. The deer bed down in cover and graze in the open on succulent grasses and herbs. Successful wintering in seasons of deep snow depends on the quality of the range in the very limited areas of suitable slope and exposure. Concentrations are in response to topographic and climatic features that are unchangeable." Bibliography of 8 titles.

Life Histories: English sparrow

Weaver, Richard L. Reproduction in English sparrows, Auk (J. Fletcher Street, 1120 Locust St., Philadelphia, Pa. $1.00 a copy), 60(1), Jan. 1943, pp. 62-74, 3 tables.

According to the author's findings, this species does not nest somewhere in the United States in every month of the year as has been reported, but has a definite breeding season, the extreme scope of which is from March to September. Two and possibly three broods may be raised in a season by one female. The eggs number 4-6, usually 5; they are described. The average loss of weight per egg per day was 1.34 percent. Incubation requires 12 days. Bibliography of 26 titles.

Life Histories: Goose, Canada

Dow, Jay S. A study of nesting Canada geese in Honey Lake Valley, California, Calif. Fish and Game (Ferry Bldg., San Francisco, Calif.), 29(1), Jan. 1943, pp. 3-18, 10 figs., 1 table.

Report upon an excellent study in Lassen County, northeastern California. Author's summary: "(1) A study was made of nesting Canada Geese on a 15,560 acre area in Honey Lake Valley, California, in 1939 and 1940. Case histories were obtained on 169 nests in 1939 and 249 in 1940; (2) during both years the nesting season began about March 1st, reached its peak by April 15th and ended by May 10th; (3) in 1939, 140 nests contained 713 eggs; an average clutch of 5.09. In 1940, 215 nests contained 1,099 eggs; an average of 5.10. The average incubation period was 28 days; (4) elevation above surrounding terrain seemed to be the most important characteristic of nesting sites. Proximity to water was another important requisite, 90 per cent of the nests being either surrounded by or not more than 30 feet from water; (5) eight distinct cover types used by nesting geese were recognized. These were tule, marsh, island, haystack, irrigated meadow, muskrat house, canal bank, and willow. Tule, marsh, island, and canal bank were the preferred types; (6) the

fate of 413 nests was determined. In 1939, 52.5 per cent and in 1940, 60 per cent of the nests were successful. Predation was responsible for the failure of the majority of unsuccessful nests. Flood, fire, trampling by cattle, and other miscellaneous factors also caused the destruction of nests; (7) during 1940, a record of egg fertility was kept on 127 nests containing 697 eggs; an average clutch of 5.48. Six hundred forty-nine, or 93 per cent of the eggs hatched; (8) the application of management methods in Honey Lake Valley should result in a larger annual crop of geese. The control of predators, particularly coyotes, during the prenesting season, the regulation of water levels, and the control of fires are methods that will produce immediate results."

Life Histories: Kite, White-tailed

Hawbecker, Albert C. A life history study of the white-tailed kite, Condor (W. Lee Chambers, Robinson Road, Topanga, Calif. 50 cents a copy), 44(6), Nov.-Dec. 1942, pp. 267-276, Figs. 82-83.

Subjects treated include: measurements, mating and nesting habits, development of young, food, essentials of habitat, and numerical status of the species. Observations in California. Bibliography of 29 titles.

Life Histories: Lizard, Fence

Fitch, Henry S. A field study of the growth and behavior of the fence lizard, Univ. of California Publ. in Zoology (University of California Press, Berkeley), 44(2), pp. 151-172, 8 tables, 1940(?).

Sceloporus occidentalis. Report on studies of marked individuals in Oregon and California over a period of 5 years. The methods of marking are described and their comparative utilities noted. The author summarizes interesting findings on growth, molt, regeneration of the tail, mating and breeding activities, territorial behavior, replacement in populations, and enemies. Bibliography of 6 titles.

Life Histories: Muskrat

Baumgartner, Luther L., and Frank C. Dellrose, Jr. Determination of sex and age in muskrats, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(1), Jan. 1943, pp. 77-81, 1 pl., 4 figs., 2 tables.

Description and illustrations of the primary sexual characters and suggestions as to their examination in living animals. Criteria for age determination also are cited from the sexual organs and age ratios for populations of two lakes in Illinois are tabulated. The distribution of weights of all of the animals examined also is recorded.

Life Histories: Muskrat

Dozier, Herbert L., and Robert W. Allen. Color, sex ratios, and weights of Maryland muskrats, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. 75 cents a copy), 6(4), Oct. 1942, pp. 294-300, 1 fig., 3 tables.

Authors' summary and conclusions: "Data are given on the 1941 catch of 9,895 muskrats (Ondatra z. macrodon) on the Blackwater National Wildlife Refuge. Of the total, 53.6 per cent were of the black color phase and 46.4 per cent brown. Variations from this percentage occurred on the 27 trapping units of the Refuge, even on adjoining areas, ranging from 42 black to 58 brown to as high as 67 black to 33 brown. Of the total catch, 9,304 were considered to be adults; these comprised 5,210 males (56%) and 4,094 females (44%). Of muskrats weighing less than 1 pound 6 ounces 450 were classified as 'kits'; they included 206 males (45.8%) and 244 females (54.2%). Trapped muskrats may not be truly representative of sex distribution on the marsh because of the greater wandering tendencies of males. Average weights were obtained for 9,311 adults. Brown animals, of both sexes, averaged 2.23 pounds (1,011.5 grams) and the black 2.27 pounds (1,029.6 grams). Decided differences were noted between the sexes, the males averaging heavier than females. The 2,462 brown males averaged 2.29 pounds (1,052.3 grams) for 2,795 black males, and 2.21 pounds (1,002.5 grams) for 2,159 black females. Many of both sexes weighed 2 pounds to 2 pounds 2 ounces; those are believed to be young animals. The 2 pound 6 ounce group contained the largest number of individuals, thought to be adults more than a year old." Bibliography of 18 titles.

Life Histories: Opossum

Hamilton, W. J., Jr. Birth in the opossum family, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 13(11), Feb. 1943, pp. 4-5, 4 figs.

Brief notes on appearance, distribution, food, habits, and fur value; with somewhat more extended comment on reproduction. The young develop only 11-13 days in the uterus, find their way to the pouch, attach firmly to the teats, and spend about 2 months there. Not until they are nearly 3 months old are they weaned. "At birth the young are so small that it would take 23 to equal the weight of a penny." Reprinted from Natural History, Nov. 1942.

Life Histories: Pheasant

Strode, Don H. Analysis of pheasant reproduction, cover utilization and mortality, Wood County, Ohio--April to October 1, 1941, Ohio Wildlife Research Station (Ohio State University, Columbus), Release No. 173, 44 pp., figs., tables (mimeographed), April 1942.

As cover, grass and weeds led, 25.4% of the pheasants being observed there. Sexual preferences were noted as to the kind of cover inhabited and the depth to which it was penetrated. Female adult pheasants observed greatly outnumbered the males, the sex ratio being 74.1:25.9. Of 1,600 "definitely sexed" juveniles, 843 were males and 757 were females. Detailed accounts of mortality of both adults and young are given. The loss of adult pheasants (24) per 100 nests in hay meadows was 37.5% higher than in all other cover types. The methods of study are explained and forms for recording data reproduced. Bibliography of 15 titles.

Life Histories: Pheasant, nesting, Ohio

Strode, Don H. The 1941 pheasant nesting study in Wood County, Ohio, Ohio Wildlife Research Station (Ohio State University, Columbus), Release 172, 36 pp., with numerous tables and charts (mimeographed), March 1942.

The annual report on this study; previous installments and other related papers are cited in a bibliography of 18 titles. The methods used in the study are described. Of the 558 nests found, 262 (47.0 percent) were successful. Details are given as to clutch size and hatch and as to nesting success in different types of cover. Clover grown for seed was best, not being cut until after the pheasant nesting season. Of 296 unsuccessful nests, 79.4 percent were destroyed by man.

Life Histories: Raccoon

Stuewer, Frederick W. Reproduction of raccoons in Michigan, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(1), Jan. 1943, pp. 60-73, 1 pl., 5 figs., 5 tables.

From author's summary: "The sex ratio among 256 raccoons was 108 males per 100 females. Accumulated evidence indicates that raccoons are promiscuous breeders; any male probably mates with more than one female in a season. Males are probably not sexually mature by the first breeding season after their birth. Fifteen of 28 yearling females produced offspring, but 10 others had none during their first year of life. In Michigan the main breeding season is from the first week in March. A few adult females breed as late as May, evidently because of failure to conceive earlier. A female bears only one litter annually. Young are born approximately 63 days after copulation; the majority arrive in April and May. The average number in 11 litters was four. Lactation extends for about 14 weeks after parturition, but young leave the den when about 10 weeks old. Females alone care for the young. Only about 50 per cent of the yearling females conceive, so that the breeding potential is 1.5 to 1 adult. Juveniles shed the milk teeth during late August and early September, when 16 to 20 weeks old; the animals grow slowly, apparently not attaining full growth until at least the end of their second year." Average monthly weights of 348 raccoons handled in the wild are graphed. Bibliography of 25 titles.

Life Histories: Robin

Howell, Joseph C. Notes on the nesting habits of the American robin (Turdus migratorius L.), American Midland Naturalist (Notre Dame, Ind. $1.00 a copy), 28(3), Nov. 1942, pp. 529-603, 5 figs., 12 tables.

Report on detailed studies at Ithaca, N. Y., relating to territory, courtship, song, nesting, eggs, hatching, development, care and feeding of young, number of broods, and nesting success. 4-1/2-page bibliography.

Life Histories: Sex ratio, ducks

Erickson, Arnold B. Sex ratios of ducks in Minnesota, 1938-40, Auk (J. Fletcher Street, 1120 Locust St., Philadelphia, Pa. $1.00 a copy), 60(1), Jan. 1943, pp. 20-34, 4 tables.

Review of literature on the subject of which 20 titles are cited. In most species the sex ratio is preponderantly male. The author's methods of study and his results are discussed and tabulated by species and seasons. Possible factors causing disparity in the numbers of the sexes include predation, selective shooting, and disease. Sex ratios varied from 1.36 to 2.21 to 1 in 3 years; and were 2.10:1 in diving, and 1.25:1 in shoal-water, ducks. The disproportion of males was not so great as has been indicated by certain banding studies.

Life Histories: Speed of birds

Cottam, Clarence, Cecil S. Williams, and Clarence A. Sooter. Flight and running speeds of birds, Wilson Bulletin (Josselyn Van Tyne, University of Michigan, Ann Arbor. 50 cents a copy), 54(2), June 1942, pp. 121-131.

Chiefly a table recording observations by the authors and by Richard Griffith on flight and running speeds of 58 forms of mostly western birds.

Life Histories: Spoonbill, Roseate

Allen, Robert P. The roseate spoonbill, Research Report No. 2 (National Audubon Society, 1006 Fifth Ave., New York, N. Y. $2.50 a copy), xviii+142 pp., 21 pls. (1 col.), 44 figs., 1942.

Congratulatory remarks upon the planning and financing of the spoonbill investigation and this report upon it are of the same tenor as those made on the parallel instance of the ivory-billed woodpecker. The roseate spoonbill is not in such desperate straits as the ivorybill, as its numbers in the U.S. during the breeding season exceed 5,000, distributed along the coasts of 3 states, and the species exists in widely scattered colonies in the Antillean, Mexican, and Central and South American regions. The present study evidently was very thorough and it has been competently reported. Chapters are devoted to distribution, abundance (including decline and recovery), migration, limiting factors, breeding-cycle behavior, food (mostly small fishes), and feeding habits, plumages and molts, and the future of the species. Recommendations for protection include continued guarding of breeding colonies in the United States, conservation ownership of breeding, roosting and feeding areas, extending to any new ones adopted, and encouragement of protection in countries to the south. An appendix gives local and foreign vernacular names for the spoonbills (those of the world are treated briefly here and elsewhere in the report), and a list of scientific names of plants and animals mentioned in previous pages. There is a long bibliography and a good index. A good job.

Life Histories: Squirrel, Fox

Cahalane, Victor H. Caching and recovery of food by the western fox squirrel, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. 75 cents a copy), 6(4), Oct. 1942, pp. 338-352, tables.

Discussion of the relation of rodents, especially squirrels to forest regeneration. Field observations on the subject of the paper were made under both uncontrolled and controlled conditions and laboratory tests were made to shed further light on the method used, and the degree of success achieved, by the fox squirrel in locating caches. The results indicate that these animals recover and consume 99 percent of the nuts they bury. While memory is of some assistance to the squirrels, a highly developed sense of smell is used with great accuracy in finding food. Locality, Ann Arbor, Michigan. Bibliography of 15 titles.

Life Histories: Swallow, Violet-green

Edson, J. M. A study of the violet green swallow, The Murrelet (Martha Flahaut, State Museum, Seattle, Wash. 50 cents a copy), 23(1), Jan.-April 1942, pp. 5-10.

A life history study touching upon the following points: Dates of arrival and departure, nesting sites including nest boxes, incubation, development of plumage and growth in weight of the young. Under normal conditions "the young of these swallows, when nest life is about two-thirds completed, attain a weight much above that of adults of the species and that a period of progressive reduction follows before full maturity." Enemies and parasites also are briefly treated.

Life Histories: Woodpecker, Ivory-billed

Tanner, James T. The ivory-billed woodpecker, Research Report No. 1 (National Audubon Society, 1006 Fifth Ave., New York, N. Y. $2.50 a copy), xii+111 pp., 31 pls. (1 col.), 27 figs., 1942.

The National Audubon Society is to be sincerely congratulated on supporting the investigation upon which this account is based and on issuing the report in excellent form. Prepared as a contribution toward conservation of the seriously endangered ivory-bill, the work is a monograph of the species embodying much information that was obtained at what may prove to be the last opportunity. The statement on distribution is based on a thorough study of the literature. Apparently Indiana records are doubted, although A. W. Butler credited them (22nd Ann. Rep. Ind. Dept. Geol. and Nat. Resources 1897 (1898), p. 329). Appearance (including characters for field recognition), habitat, history of disappearance (almost everywhere due to logging), present distribution and number (22), ecology, history in the Singer Tract, La. (harboring 6 specimens), food and feeding habits, effects of food on distribution, other factors affecting the species, general habits, territory and courtship, nesting, care of young, causes of nesting failure, and conservation are subjects that are carefully and clearly discussed.

"Ideal measures for the conservation of the Ivory-billed Woodpecker would be to preserve in their entirety areas inhabited by the bird, as refuges and as primitive areas. The most important areas in the country are the Singer Tract in Louisiana, the Big Cypress and lower Apalachicola River swamps in Florida, and possibly parts of the Santee River swamp in South Carolina. The area necessary for an Ivory-billed Woodpecker refuge would be about two and a half to three square miles of good habitat for each pair of the birds. Where the chief obstacle to the establishment of a refuge is the high value of the timber, as in the Singer Tract, a program of selective cutting is recommended whereby sound and valuable timber may be cut and sold, leaving dead and dying trees to supply borers to the woodpeckers. The quantity of woodpecker food may be artificially increased by killing certain trees. The Ivory-bill must be granted complete protection from man by the barring of all hunters and collectors from areas inhabited by the woodpecker." An appendix gives technical and vernacular nomenclature of the ivory-bill, discusses its relation to other species, describes the plumage, records measurements, and gives scientific names of animals and trees mentioned in the main text. There is an exhaustive bibliography and index. A fine contribution.

Management: Aquatic wildlife

Zimmerman, F. R. Water levels in relation to fur bearers and waterfowl in central Wisconsin, Wisconsin Conservation Bulletin (Wisconsin Conservation Dept., Madison), 8(1), Jan. 1943, pp. 23-26, 3 photos.

Flowages created by Federal aid have provided environment for fur animals and for water, marsh, and shore birds, have reduced fire hazards, and raised water tables. Benefits to wildlife on 35 flowages are discussed, and recommendations are made as to management of beavers, muskrats, and waterfowl; as well as of water levels. Bibliography of 7 titles.

Management: Attracting birds

Petrides, George A. Attracting birds to your home, National Park Service, Washington, D. C., 4 pp. (processed), 20 figs., 1942.

Brief instructions as to winter feeding stations and their provisioning, also on catering to birds during the warmer months; discussion of pests at feeding stations; warning as to disease hazards; and notes on bird study in National Capitol Parks.

Management: Bear

Tubbs, Farley F. Tramp bears, Michigan Conservation (Michigan Dept. of Conservation, Lansing), 11(9), Oct. 1942, pp. 6-7, 4 photos.

National Parks unfortunate experience with tourists and bears is being paralleled in Michigan. Instances of trouble are cited and the advice given to cease pauperizing and "taming" bears.

Management: Beaver

Mire, Frank B., and A. B. Hatch. Administration of beaver in the western United States, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(1), Jan. 1943, pp. 81-92, 1 fig., 5 tables.

The authors estimate that in 1940-41 there were about 324,000 beavers in 11 western states and that nearly 54,000 pelts of a value in excess of a million dollars were harvested. In most of these states there is no legal provision for taking beavers except to control damage, incentive for private beaver management is lacking, and no satisfactory means has been devised of stopping interstate traffic in contraband skins. Each of these shortcomings is discussed and recommendations are made for overcoming them. The good and harm done by the animals also are detailed.

Editorially, it may be pointed out that employing beaver as a plural is English, rather than American, usage and that the term "hot" is slang for contraband, a word that does not appear in the paper.

Management: Cottontail

Haugen, Arnold O. Management studies of the cottontail rabbit in southwestern Michigan, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(1), Jan. 1943, pp. 102-119, 2 pls., 3 figs., 1 table.

Ecology of the study area and methods of the investigation are described; live-trapping was extensively employed. Artificial feeding did not increase numbers the next year. The provision of artificial burrows did not increase the fall population. Stocking in spring was not followed by a significant increase the next fall. The brush piles provided were used considerably and were instrumental in retaining a larger than average number of rabbits on the experimental area during the winter. In general, application of management measures was not reflected in numbers of the animals (one year's trial). Costs of the treatments adopted are stated. General discussion refers to prolificacy (about 20 young per female annually), territorial requirements, limiting factors, movements of the animals, including predation, cover management, food plantings, and encouragement of species making burrows the cottontails can use. Bibliography of 16 titles.

Management: Cottontail

Langenbach, John R., and John D. Beule. A progress report on cottontail rabbits in Pennsylvania, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 13(8), Nov. 1942, pp. 14-15, 30, 3 photos, 2 tables.

Report on experimental study of the comparative survival of stocked western and native rabbits and summary of life history investigations of cottontails in relation to their management in Pennsylvania. Authors' conclusion: "From the results of the experiments and investigations, it would

seem apparent that: (1) mortality in rabbits from time of release is approximately equal in respect to the sex; (2) mortality prior to the breeding season, in imported Western rabbits can be expected to be between 20 and 25 per cent, while in redistributed native rabbits it is between 5 and 7 per cent; (3) the average female cottontail cannot be expected to produce more than four mature young annually; (4) the importation of Western rabbits produces a very small percentage of the annual kill of cottontails in Pennsylvania and cannot be expected to reestablish a large shooting population at a reasonable cost; and (5) perhaps management of land for better natural protection of cottontail rabbits would increase the population to the desired level with considerably less expenditures of Game Commission funds."

Management: Deer, White-tailed

Anon. The white-tailed deer in Pennsylvania, Pennsylvania Game Commission (Harrisburg), Educational Pamphlet No. 6, 12 pp., 11 photos, 1942.

The early history of Pennsylvania deer is traced, including their decline, offset in part by introductions from 7 states, and their increase to the point where they became a pest on both farms and forests. The pamphlet is mainly devoted to an account of efforts to manage the herd by conventional and special open seasons and by a variety of other methods. "Today the deer problem is perhaps no less acute in some sections than in 1928, although antlerless deer seasons and combined buck and doe seasons are assuredly effecting more proper control and the animals are being gradually reduced commensurately with their food supply in many areas." The kill by bobcats "amounts to practically nothing from a control standpoint." Deer life history is briefly summarized. The number of hunting licenses issued, of fatal and non-fatal accidents, the number of deer killed, and the character and extent of open seasons for each year from 1915 to date are recorded.

Management: Forest Wildlife

Bordner, John S. Forests and land use, Wisconsin Dept. of Agriculture (Madison), Bul. 229, 56 pp. (10-3/4" wide x 7-3/4" high), illus., 1942.

The relation of forests and forestry to wildlife is discussed on pp. 44-46, with particular reference to swamp and lake environments, and to timber-cutting and stream improvement.

Management: Forest Wildlife

Swift, Lloyd W. Wild life under cover, National Humane Review (135 Washington Ave., Albany, N. Y.), 31(2), Feb. 1943, pp. 13-15, 3 photos.

Ecological requirements of animals exemplified by a description of what might be seen in a tour of a western national forest. Suggestions as to what has been found necessary in the management of wildlife in the West.

Management: Harvest

Slaybaugh, N. E. Pennsylvania 1941 game harvest, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 13(10), Jan. 1943, pp. 4-5, 18-19, 5 photos, tables.

Returns from licensed hunters in 5 years have varied from 69 to 89.7 percent without, and from 93 to 98.5 percent with, reminders. Details from this excellent showing are discussed, tabulated, and compared with those of the preceding pentad. In the last half-decade, the game kill has exceeded 5 million head every year. Far in the lead in the statistics are cottontails and squirrels. The tonnage of meat has averaged some 9,500 annually.

Management: Harvest, cottontail

Katz, David T. A survey of the 1940 rabbit hunting season, Ohio Wildlife Research Station (Ohio State University, Columbus), Release 171, 37 pp., with numerous charts, figs., and tables (mimeographed), Dec. 1941.

Of 10,912 questionnaires placed in the hands of hunters, 1,679 were returned for compilation. From these it was concluded that "20% of the hunting took place the first two days and 75% of the hunting took place in November. Shortening the season one hunting week (6 days) would cause about 8% less hunting and 4% less kill; shortening it by 2 hunting weeks (12 days) would cause about 10% less hunting and 6.5% less kill. A short extension of the season would increase the hunting done by less than 1% per hunting day." Replies to two questions indicated a 9% decrease in the number of rabbits in one year and 30% decrease in ten years.

Management: Hedgerows in relation to wildlife

Petrides, George A. Relation of hedgerows in winter to wildlife in central New York, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. 75 cents a copy), 6(4), Oct. 1942, pp. 281-290, 2 pls., 7 tables.

Author's summary: "Natural hedgerows on two farm areas near Ithaca, New York, were studied from October 1, 1939 to April 1, 1940, to determine the interrelationships in winter between animal and plant associations and to obtain data on types of contour hedgerows most efficient in soil and wildlife conservation for central New York. Four stages in hedgerow plant succession are described: herb, shrub, small-tree, and tall-tree stages. Food and cover for wildlife were best provided by shrubs and vines. Of 17 bird species resident, in either summer or winter, in these hedgerows, 12 were sparrows. Winter bird populations were concentrated in hedgerows which, although deficient in late winter foods for birds, provided some provender and cover for travel, escape, and feeding in otherwise open, snow-covered country. Strips of land near hedgerows were most thoroughly hunted by feeding birds. x x x Ring-necked pheasants used hedgerows for feeding, roosting, and travel; about one-third of 69 individuals flushed sought hedgerows in escape. A review of the literature indicates that hedgerows 10 to 15 feet wide would decrease predation on pheasant nests. Cottontail rabbits in hedgerows lived exclusively in wood-

chuck burrows during late winter; they shunned hedges lacking these retreats except for limited feeding. Rabbits in hedgerows browsed intensively on a few uncommon hedge plant species. Refuse of fleshy fruits collected by squirrels was consumed by cottontails in several instances. The sites of woodchuck burrows indicated a decided preference of these animals for rocky locations in hedgerows more than 10 feet wide. Both gray and red squirrels used hedges in feeding and travelling. White-footed mice consumed large quantities of hedge fruits. Eight other mammals of less importance are discussed briefly. The activities of both birds and mammals were greatest in low, shrub-stage hedgerows where fruit, browse, and cover were most abundant. All of the species of hedgerow plants eaten by wildlife were most common in hedges of this type. Hedgerows 10 to 15 feet wide were preferred by songbirds, woodchucks, and cottontail rabbits. Plant species of great density are desirable in hedgerows, but the total amount of cover provided is of greater importance. The less dense the plant species comprising a hedgerow, the wider the hedgerow should be. Hedgerows in the shrub stage are of most value to wildlife. In natural hedgerows, the shrubs should be preserved by removing associated species of greater potential height. For greatest efficiency in soil and wildlife conservation in the central New York region, it is recommended that contour hedges be composed entirely of shrubs and vines. They should be from 6 to 10 feet high, 12 to 15 feet wide, and of good density near the ground. Their plant composition should provide late winter foods for wildlife and be so controlled as to insure permanency of growth form. A list of plants providing for wildlife in hedgerows of this region is given." Bibliography of 24 titles.

Management: Inventory

Hickel, M. R., and Lloyd W. Swift. Counts of bucks vs. shed antlers in Rocky Mountain mule deer, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(1), Jan. 1943, pp. 123-124, 1 table.

Counts of shed antlers tally very well with those of the deer themselves, hence are promising in connection with census efforts and especially in obtaining antler-class groupings of a deer herd.

Management: Inventory, brant, black

Moffitt, James. Twelfth annual black brant census in California, Calif. Fish and Game (Ferry Bldg., San Francisco, Calif.), 29(1), Jan. 1943, pp. 19-28, 2 tables.

Delayed somewhat by wartime conditions, this report states that the census was almost as satisfactory as in previous years. Like its predecessors, it discusses the brant populations of the principal wintering areas, and tabulates the counts in comparison with those of former years. The number of birds, some 64,000, indicates good maintenance, despite eel-grass conditions that were expected to have a serious effect. Apparently, however, there was marked improvement in the stands of this important food plant though the disease is still prevalent and the eel-grass still depleted in some areas. So far the effects of the malady seem mild compared to those earlier wrought on the Atlantic Coast.

Management: Inventory, lake

Bordner, John S. Inventory of northern Wisconsin lakes, Wisconsin Dept. of Agriculture (Madison), Bul. 228, 104 pp. (10-3/4" wide x 7-3/4" high), illus., tables, 1942.

Third edition of a publication designed to aid in bringing about a better social and economic status in the Northern Wisconsin Highlands. The general nature of the lakes is outlined and their vegetable and animal life discussed and illustrated in considerable detail. Viewing the lake as a farm is recommended. A lengthy tabulation shows the location of many lakes, records their areas, maximum depths, and character of water, notes their aquatic and shore vegetation, and indicates their present, and possible future, productivities. Bibliography of 28 titles.

Management: Muskrat

Highby, Paul R. A management program for Minnesota muskrat, Proc. Minn. Acad Sci. (John W. Moore, Botany Dept., University of Minnesota, Minneapolis, Minn. $1.00 a copy), 9, 1941, pp. 30-34 (1942).

The paper briefly reviews the muskrat seasons for the 11 years 1930-40. After a spring trapping season, two years were required for recovery before another season could be opened. A system of muskrat refuges for Minnesota is suggested. Arguments are presented favoring a winter season in order to avoid losses which occur when trapping is deferred until spring. These losses include: Winter kill by freezing, starvation, and disease; losses through migration, mink predation, and in connection with mink trapping. Small or kit pelts are taken in fall but this loss probably is offset by those among spring pelts damaged as a result of fighting among the animals. Data on state auction sales of seized and legalized furs are presented which show that the winter-caught pelts brought the highest prices in the Minnesota raw fur market in 1940. Several proposals are made for research on muskrats. Paul R. Highby.

Management: Muskrat

Lay, Daniel W., and Ted O'Neil. Muskrats on the Texas coast, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. .75 cents a copy), 6(4), Oct. 1942, pp. 301-311, 2 pls., 2 figs.

Discussion of the marshes, their flora, history, and management in relation to muskrat populations. Authors' summary: "(1) The 260,000 acres of coastal marshes in Texas have produced a maximum crop of 350,000 muskrat pelts; (2) a study of fresh to slightly brackish marsh has demonstrated the value of severe burns in sawgrass and cane to encourage the increase of cattail, smooth cordgrass, and three-cornered rush; (3) excluding all brackish water reduces the preferred muskrat habitat of brackish plant communities. Final success of a management program of burning and ditching is prejudiced by excluding brackish tides; (4) it is demonstrated that ditches drain off excess water, provide levees for muskrat travel lanes and rest during high

water, and serve for access by trappers; (5) the value of alligators for making water holes and aiding to keep ditches open is recognized by trappers despite former prejudices against these reptiles as muskrat predators; (6) the brackish marsh study gave encouraging preliminary results in the improvement of low prairies by impounding water with levees and dams. On clay soils the formation of peat desired by muskrats for burrowing will be important in the ultimate success of efforts to make new muskrat marsh; (7) the brackish to saline marsh studied has not been managed; conflicting land uses involve practices harmful to muskrats. Clear summer burns when the marsh is dry forced muskrats to move. Return of the muskrats is discouraged by the lack of house-building material, even after rains. Cattle damaged muskrat beds and runways severely, forcing the muskrats to move; (8) late summer burning attracted geese in great flocks, causing losses in muskrat foods and physical damage to the marsh. Such competition could be prevented by fall-burning of adjoining prairies to produce succulent greens and by spring-burning the muskrat marsh. Moderate hunting also helps to keep the geese from concentrating on a muskrat marsh; (9) legal trapping seasons should be long enough to enable operators to trap in accordance with local conditions as to weather and muskrat populations. Traps set close to muskrat beds may be somewhat selective of breeding females and young."

Management: Overpopulations, deer

Aldous, Shaler E. Winter deer food problem, Conservation Volunteer (Minnesota Dept. of Conservation, St. Paul), 5(27), Dec. 1942, pp. 37-39, 1 fig.

The carrying capacity of a deer range is governed by the winter food supply, and according to that criterion, northern Minnesota is overpopulated. Yarding confines the animals to about 10 percent of their summer range and winter restricts their dietary to a fraction of its summer amplitude. Of the predominantly available conifers, only white cedar is highly nutritious. This and other valuable foods of the yards are much overbrowsed. The only remedy for the plight of the deer is reduction of their herds until they are in proper balance with the winter food supply. If not done by man, it will be done by nature and in a more cruel and wasteful manner. Winter feeding, except locally by cutting off branches or felling undesirable trees, is too costly for wide application.

Management: Refuges

Gabrielson, Ira N. Our national wildlife refuges, Field & Stream (515 Madison Ave., New York, N. Y. 20 cents a copy), 47(7), Nov. 1942, pp. 16-17, 42, 5 photos; 47(8), Dec. 1942, pp. 16-17, 72-73, 83, 5 photos.

There are now 283 refuges under control of the Fish and Wildlife Service. They are discussed under three classes: Island refuges for colonial birds; big game ranges; and marsh and lake areas primarily for the conservation of migratory waterfowl. Typical examples are described, their history sketched, and their protective functions outlined.

Management: Refuges

Pirnie, Miles D. The W. K. Kellogg Bird Sanctuary, Turtox News (General Biological Supply House, Inc., 761-763 East 69th Place, Chicago, Ill.), 21(1), Jan. 1943, pp. 13-15, 1 photo.

Location, history, description, and fauna of this refuge, and account of studies carried on there.

Management: Regulated hunting

Benjamin, J. R. State supervised hunting in Ohio in 1941, Ohio Wildlife Research Station (Ohio State University, Columbus), Release 175, p. 23, charts and tables (mimeographed), March 1942.

Author's conclusions: "(1) During the upland game season the concentration of hunters should never exceed one per 30 acres. Such a rule is not yet necessary for either squirrel or waterfowl shooting; (2) pre-hunting season game censuses should be made to determine the removable game surpluses; (3) areas not suited for a particular type of hunting should not be opened for that season, as otherwise poaching on out-of-season game is encouraged."

Management: Stocking, bobwhite

Anon. The propriety of attempting to restore bobwhite quail in Texas by raising quail in pens for release in the wild (Texas Game, Fish, and Oyster Commission, Austin), 14 pp. (mimeographed), Aug. 1942.

The prevailing belief that quail can be increased in the proportion that propagated birds are released in the field is fallacious. Encouragement of natural propagation is both more economical and more effective. As a vocation, quail breeding is no royal road to wealth; since 1933, 890 breeders have been licensed in Texas but they stayed in business, on the average, only 15 months; they lost nearly half of their stock from diseases; and only 11 percent of the birds were used for restocking. The cause of quail decline--depletion of environment--and the practical means of restoration--by management--are discussed. The leaflet details experience in other states (Pennsylvania, Oklahoma) and opinions of authorities (Arthur L. Clark, Walter P. Taylor, Herbert L. Stoddard) largely adverse to the use of artificially propogated bobwhites for restocking. The final paragraph is: "To summarize our conclusions as to why the State of Texas should refrain from establishing a quail hatchery: (1) There is no evidence that such an enterprise would be economically sound. (2) There is no evidence that such a plant would supply information that is not already available since some of the other States, ammunition manufacturers, and private individuals are carrying forward their experiments to determine the practicability of this kind of work. (3) All evidence points to the fact that a quail hatchery or a series of them would not increase the number of quail to be hunted by the sportsman of Texas. (4) More quail can be produced for the hunter's gun if the money is spent for education and encouragement of better land use practices that will improve the quail environment, and for experimental work to learn what specific quail management techniques can be applied to Texas conditions and Texas wild quail population."

Management: Stocking, pheasant

Benjamin, Joel R. 1941 pheasant band returns, Ohio Wildlife Research Station (Ohio State University, Columbus), Release 174, 15 pp., charts and tables (mimeographed), April 1942.

This is the third report on State-conducted banding studies in Ohio. The author concludes, in part, that "Wild-trapped birds have a better chance of survival than game farm adults released in late winter and early spring. They have learned to forage for themselves and to take advantage of cover. They are also frequently released in more favorable habitat than many game farm birds. They have not been brailed, and can fly better than farm stock. There was a higher percentage of returns from June released adults than from either wild-trapped or February-March releases." This probably was due to improved food and cover conditions.

Management: Transplanting antelopes

Nichol, A. A. Gathering, transplanting, and care of young antelopes, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. 75 cents a copy), 6(4), Oct. 1942, pp. 281-286, 1 pl.

This account of reintroduction of the prong-horn antelope into the Tucson Mountain Park, Arizona, describes methods of capturing, transporting, and caring for the fawns. Formulas for feeding, and treatment to relieve dietary upsets, are discussed; extreme cleanliness was found necessary. Of the 11 fawns captured, 4 died from various causes and the remainder were liberated in late summer. "At sixteen months of age they were thriving and vigorous and had accommodated themselves to the desert range. Despite their hand rearing and close contact with man, enough of their wild nature had reasserted itself by the time they were ten months old to make them unapproachable."

Management: Water supply

Bond, Richard M. Ramps for escape of wildlife from stock-troughs, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(1), Jan. 1943, p. 123, 1 pl.

"Straight-sided watering troughs for stock in arid country are often death traps for small birds and mammals." This article describes and illustrates three types of escape ramps.

Management: Winter feeding

Schwall, Eugene E. Feeding station suggestions, Ohio Conservation Bul. (Ohio Division of Conservation, Columbus. 10 cents a copy), 6(11), Nov. 1942, p. 19, cartoon.

How to locate, build, and service feeders. Ear corn, scratch feed, alfalfa, salt, and grit should be supplied. General suggestions on winter feeding.

Natural History: Birds of Oklahoma

Baumgartner, F. M., and J. C. Howell. Notes of the numerical status and migration of the birds of the Lake Carl Blackwell project in north central Oklahoma, Proc. Okla. Acad. Sci. (H. J. Harper, Okla. Agricultural and Mechanical College, Stillwater), 22, 1942, pp. 53-64.

In general only faunal lists of state or equivalent scope are noted here, but an exception may be made of this paper on account of its value as a supplement to that on the management of Lake Blackwell abstracted in WILDLIFE REVIEW, No. 34, May 1942, pp. 50-51. The present article comments on the abundance and records the season of occurrence of 203 species of birds.

Natural History: Mammals of Illinois

Mohr, Carl O. Distribution of Illinois mammals, Trans. Ill. Acad. Sci. (Librarian, Illinois State Museum, Springfield. Separates obtainable from Ill. Natural History Survey, Urbana), 34(2), Dec. 1941, reprint 4 pp., 4 maps, 5 tables.

The tables list mammals that occur: in every county (12 forms), in all but a few counties (21), in the northern third (4), and the extreme southern parts (12) of the State, and also those of peculiar or restricted distributions (16), which are outlined. The occurrence and abundance of squirrels are rather fully discussed.

Natural History: Puma

Shoemaker, Henry W. The panther in Pennsylvania, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 13(11), Feb. 1943, pp. 7, 28, 32, 2 photos.

The last payment of bounty upon a panther in Pennsylvania was in 1836. The present article cites evidence, widely varying in quality, as to possible later occurrence of the animal.

Natural History: Vertebrates of Ontario

Snyder, L. L., E. B. S. Logier, and T. B. Kurata. A faunal investigation of the Sault Ste. Marie region, Ontario, Trans. Royal Can. Inst., 24(1), 1942, pp. 99-165. (Reprints obtainable from the Royal Ontario Museum of Zoology, Ottawa, Canada, at 25 cents a copy).

Description of environment and climate. Annotated lists of 39 species of mammals and 133 of birds by L. L. Snyder, and of 7 reptiles and 12 of amphibians by E. B. S. Logier. Each section is accompanied by a list of literature cited. Kurata's contribution relates to spiders.

Natural History: Wildfowl

Kortright, Francis H. The ducks, geese and swans of North America. Illustrations by T. M. Shortt (American Wildlife Institute, Investment Bldg., Washington, D. C. $4.50 a copy), viii+476 pp., 36 col. pls., numerous maps and text figures.

This is the best single-volume, general treatment of the wildfowl in existence and the authors and the Wildlife Institute are to be congratulated upon it. The principal author notes that it is entirely compiled, but he has done a good job, giving the work a high degree of inclusiveness, especially of hard-to-get items of information. More than 60 pages are devoted to matter preparing the reader to make the best use of the main part of the work, which is devoted to "Descriptions, identifications and life stories of the ducks, geese and swans." In this section, every species is treated comprehensively, information typically being given on scientific and vernacular names, description and specimen identification, sex and age differences in plumage, field marks, voice, habits, food, and range and migrations. A special chapter records extreme and average weights and measurements. Contributions from other authors are two on "Migration routes and flyways" and on "Banding waterfowl" by Frederick C. Lincoln (pp. 47-54, Figs. 32-35b); and one by Ira N. Gabrielson on "Conservation of waterfowl" (pp. 55-61, 1 map). In the lavish illustrations, the artist, T. M. Shortt, had opportunity to show a varied facility in producing: accurate figures of structural details, sketches revealing intimate knowledge of the habits and appearance of the birds in life, and the colored plates which, more thoroughly than any previous attempt, illustrate general appearance, recognition marks, and states of plumage such as the eclipse, and that of downy young. As Leopold suggests in an introduction, sportsmen can well apply themselves to this book and learn something about ducks in addition to the hunting of them. There is a 9-page bibliography and an index. The book is well made and tastefully and substantially bound.

Predation: Bobcat upon deer

Marston, Merwin A. Winter relations of bobcats to white-tailed deer in Maine, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. 75 cents a copy), 6(4), Oct. 1942, pp. 328-337, 1 fig., 1 table.

Description of winter habits of bobcats in Maine; review of publications on their food in other regions, and statement of results of stomach analysis and field observation in Maine. Author's summary: "The results of food habit studies on the bobcat over the United States are somewhat confusing; New England studies indicate that deer meat is an important food, and more may be obtained by direct predation than has been thought likely. The toll is not limited to young or weak individuals; some cats perhaps kill wantonly more deer than they can utilize. The bobcat ranges widely in hunting and uses several different resting places; one may cover a territory of more than 40 square miles. It hunts mostly at night, approaches deer stealthily, makes a surprise attack, and in nearly all cases kills by biting the throat of the deer. The bobcat is more dangerous to deer during periods of easy traveling, although with deep snow and difficult traveling the deer herds are more concentrated. Generally the bobcat does not eat all of a kill, utilizing it more thoroughly when bad traveling conditions force the cat to remain near a carcass for several days. Smaller bobcats are fully as harmful to deer as larger ones. Bobcats are not selective in hunting; ordinarily they kill any deer they are able to approach. Definite quantitative information on the amount of damage inflicted is difficult to obtain, but the number of kills found indicates it to be considerable in some localities." Bibliography of 9 titles.

Predation: Weasel

Glover, Fred A. Killing techniques of the New York weasel, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg, Pa. 10 cents a copy), 13(10), Jan. 1943, pp. 11, 23, 4 photos.

Observations upon animals in captivity.

Research: Food habits

Baumgras, Philip. A technique for confining nestling crows in food-habit studies, Wilson Bul. (Josselyn Van Tyne, University of Michigan, Ann Arbor. 50 cents a copy), 54(4), Dec. 1942, pp. 251-252.

At the Rose Lake Wildlife Experiment Station, Michigan, four nests with young, of the crow (Corvus b. brachyrhynchos) were selected for study. The young were confined in cages made from nail kegs (which are described) where the parents continued to feed them, and from which ample collections of pellet and other food items were obtained and preserved for further study.

Research: Fur priming

Stuewer, Frederick W. Studies of molting and priming of the fur of the eastern raccoon, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 23(4), Nov. 1942, pp. 399-404, 3 figs., 1 table.

Report based upon examination of 256 live raccoons, and 5,214 pelts in Allegan County, Michigan. The progress of molting and priming is discussed. Of the total number of pelts, 71 percent were prime; a larger proportion of small, than of large, pelts were unprime.

Research: Live trapping

Mills, Robert H. A live-trapping study at O.S.U., Ohio Conservation Bul. (Ohio Division of Conservation, Columbus. 10 cents a copy), 6(11), Nov. 1942, pp. 20-21, 3 photos.

Methods and results, including life-history notes, for cottontails, opossums, and raccoons.

Research: Marking by spurts of dye

Moffitt, James. Apparatus for marking wild animals with colored dyes, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. 75 cents a copy), 6(4), Oct. 1942, pp. 312-318, 1 pl.

Description of apparatus and dyes, methods of using them, and the results in marking sage grouse on their strutting grounds. Suggestions as to further improvements in the process and of other species to which it might be applied.

Research: Population studies

Baker, Rollin H., and Hilbert R. Siegler. Use of bag records of big game to determine sex ratios and population densities, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(1), Jan. 1943, pp. 11-13, 2 tables.

After analysis of the kill on shooting preserves in Texas as reported by Earl Sanders (Journ. Wildlife Mgmt., 5(2), 1941, p. 187, in a paper abstracted in WILDLIFE REVIEW, No. 31, June 1941, pp. 33-34) the authors conclude: "(1) More practicable and simpler wildlife census methods are needed; (2) where accurate records of the kill of big game on a known acreage are kept, it is possible by statistical methods to show the limits for sex ratio and population density, and to disprove absurd estimates; (3) the usefulness of this method is limited; its value increases in proportion to the completeness of the field data."

Research: Restraining tube

Shadle, Albert R., and Wm. R. Ploss. A metal restraining tube for animals, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 23(4), Nov. 1942, pp. 441-443, 1 fig.

Devised for handling porcupines; has proved useful also for beavers. Description and illustration.

Research: Sexing muskrats

Dozier, Herbert L. Identification of sex in live muskrats, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. 75 cents a copy), 6(4), Oct. 1942, pp. 292-293, 2 pls.

Description, with clarifying illustrations, of a method of palpation by which the sex of adult muskrats can be determined. Also suggestions as to the more difficult problem of sexing young animals.

Research: Trapping methods

Goodnight, Clarence J., and E. J. Koestner. Comparison of trapping methods in an Illinois prairie, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 23(4), Nov. 1942, pp. 435-438, 1 fig., 2 tables.

As a means of estimating animal populations, live- and dead-trapping were found by these authors to have comparable values. Work with killer type traps requires less time.

U. S. Government: Fish and Wildlife Service

Gabrielson, Ira N. [Annual Report of the] Fish and Wildlife Service [in the] Annual Report of the Secretary of the Interior, Fiscal Year ended June 30, 1942 (Supt. of Documents, Washington, D. C. 45 cents a copy), pp. 185-232, 1943.

This summary like those of other bureaus in the Department has been condensed about 50 percent from its usual recent volume. Stress also has been placed upon activities directly related to the prosecution of the war--especially food production. However some account remains of all the principal lines of work of the Service including predator and rodent control, fur production, waterfowl management, economic, biological, and disease investigations, conservation of wildlife on national parks and Federal wildlife refuges, and Federal aid in wildlife restoration.

WILDLIFE LEAFLETS

Issues of interest to wildlife managers additional to those previously mentioned are listed below. Copies of these mimeographed leaflets can be obtained from the Fish and Wildlife Service, U. S. Department of the Interior, Chicago, Ill.

220. Blackbirds and grain crops in the eastern United States, by E. R. Kalmbach, 5 pp., June 1942.

Legal status of blackbirds; frightening by shooting or other means; poisoning; avoiding damage through changes in agricultural practices. Supersedes Leaflets Bi-908 (1926) and BS-96 (1937).

221. Treatment of oil-soaked birds, by Frederick C. Lincoln, 2 pp., July 1942.

Directions for cleaning birds, the plumage of which is saturated with oil; general statement about this hazard; and reference to the Oil Pollution Act of 1924.

222. Laboratory procedure in wildlife food studies, 11 pp., June 1942.

Directions for analyzing stomach contents, scats, and other materials illustrative of food habits; for recording the results; and for storing the examined material. Supersedes Leaflets Bi-1515(1933) and BS-30 (1936).

223. Natural plantings for attracting waterfowl to marsh and other water areas, 4 pp., October 1942.

A regulation under authority of the Migratory Bird Treaty Act forbids planting of agricultural crops to attract birds for shooting. There is no bar, however, to improvement of areas by establishing permanent stands of marsh and aquatic plants. Suggestions are given for muddy waters of fluctuating levels, for coastal marshes and ponds, and for miscellaneous areas. This supersedes Leaflet BS-125 (1939).

224. Birds as a factor in controlling insect depredations, by Clarence Cottam and Francis M. Uhler, 6 pp., November 1942.

Exposition of the general value of birds, their particular usefulness in holding insect populations at normal levels, but also their services in severe outbreaks, of which recent instances are described. Supersedes Leaflet BS-162 (1940).

225. The status of migratory game birds: 1941-42, 9 pp., September 1942.

Annual summary of investigations to determine the status of wild ducks, geese, and swans upon the breeding and wintering grounds and the flyways. Report upon the January inventory, which indicated a larger increase than in any previous year of the series (since 1936). Discussion of the condition of the woodcock, Wilson's snipe, rails and coots, mourning and white-winged doves, and the band-tailed pigeon.

226. Abstract of fur laws, 1942-43, 43 pp., November 1942.

Digest of the Federal Lacey Act as it affects shipment of animals in violation of State law, and of the laws relating to fur animals in the United States and the Canadian Provinces. Contains also a directory of officials from whom copies of fur laws may be obtained.

227. Wildlife contributions to the Nation's war program, by Edna N. Sater, 13 pp., December 1942.

Relates mostly to fisheries, but includes discussion of the value of the Federal program of control of damage by predatory animals and rodents (including house rats and mice); of its cooperation in the production and wise utilization of furs; of its regulation of game take; and protection of wildlife in Alaska and upon refuges.

228. Suggestions for bird field study, by May Thatcher Cooke, 7 pp., November 1942.

Equipment, favorable places, methods; suggestions as to field identifications, value of permanent notes, and as significance of bird study. Contains a list of books, periodicals, pictures, and disk-recorded bird songs, together with addresses from which they may be obtained. Supersedes Leaflets Bi-922 (1927), BS-76 (1936), and BS-150 (1940).

NOTES AND NEWS

Dr. Rudolf Bennitt of the Missouri Cooperative Wildlife Research Unit offers two correspondence courses in wildlife management which are available through the Extension Division of the University of Missouri at Columbia. These relate to principles of wildlife conservation and to practical wildlife management.

No more Midwest Wildlife Conferences are to be held until after the war. The proper time for reconvening of the conference has been left to the discretion of the Missouri Conservation Commission and the Department of Zoology of the University of Missouri.

With more than 30 percent of its members in military services, The Wildlife Society, says Dr. Lee E. Yeager, Treasurer, has probably given as large a proportion of its members to the war effort as has any professional group in the country. Though intensely occupied with other things, the service members are continuing their support of the Society. Communications from them have been received from numerous stations, some of them abroad.

The Illinois Natural History Survey (Urbana) has issued as its Manual No. 3 a Fieldbook of Native Illinois Shrubs (307 pp., 6 col. pls., 75 figs., 1 map, December 1942), a thorough and excellent handbook of its subject. It contains keys to genera and species, descriptions and notes on distribution, a glossary, and index. It should be most useful to Illinois students of wildlife. The author is Leo. R. Tehon.

Wildlife managers can benefit by the suggestions about shrubs for different regions and on how to grow them in the following excellently prepared and effectively illustrated book: Ornamental American Shrubs, by William R. Van Dersal. xiii+278 pp., 68 pls. + col. frontispiece, 1942 (Oxford University Press, 114 Fifth Ave., New York, N. Y. $4.00 a copy).

Although in story form, William M. Rush's volume "Wild Animals of the Rockies," xxiii+296 pp., 16 pls., 1942 (Harper and Brothers, 49 East 33rd St., New York, N. Y. $3.00 a copy) embodies the results of many years of good opportunities for observing animals in nature. Statements of fact, therefore, should be dependable. The writing is entertaining.

Wildlife managers having the problem of stabilizing sand dunes will welcome the following thorough treatment of the subject by William T. McLaughlin and Robert L. Brown, "Controlling sand dunes in the Pacific Northwest" (U. S. Dept. Agr. Circ. 660, 46 pp., 24 figs., 4 tables, Sept. 1942. Supt. of Documents, Washington, D. C. 10 cents a copy).

Of interest to many readers of WILDLIFE REVIEW is the recent work on "Systematics and the origin of species," by Ernst Mayr (xiv+334 pp., 30 figs., 13 tables. Columbia University Press, New York, N. Y., 1942. $4.00 a copy). It discusses the: Methods and principles of systematics, Taxonomic characters and their variation, Geographic variation, Systematic categories and the new species concept, Polytypic species, The species in evolution, The biology of speciation, and The higher categories and evolution. There are 16 pages of bibliography and 20 of index.

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